NATIONAL AGRICULTURE DEVELOPMENT PROGRAMME (NADP)

DISTRICT AGRICULTURE PLAN

THOOTHUKUDI

CENTRE FOR AGRICULTURAL AND RURAL DEVELOPMENT STUDIES
TAMIL NADU AGRICULTURAL UNIVERSITY
COIMBATORE -641 003

NATIONAL AGRICULTURE DEVELOPMENT PROGRAMME (NADP / RKVY)

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2017

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The District Agriculture Plan aims at achieving and sustaining the desired annual growth by ensuring holistic development of agriculture and allied sectors such as agriculture, horticulture, agricultural engineering, agricultural marketing, animal husbandry, fisheries, seed certification, organic agriculture, aavin and strengthening R&D. It has to be ensured that the local needs/crops/priorities are better reflected in the agricultural plans.

In order to make the development of agricultural and allied activities more inclusive and also to emphasize bottom up approach in the planning process, block level stakeholders' meetings were conducted by involving all the block level officials, agricultural scientists, farmers, peoples' representatives and so on. The interventions suggested in the block level meetings were incorporated in the District Agriculture Plan. For each block, one scientist from TNAU was nominated to gather the physical and financial aspects and to prepare the block level plan.

Thoothukudi district was carved out of the erstwhile Tirunelveli district on October 20, 1986. Thoothukudi was a major natural pearl fishing center till last century. It has one of the oldest ports in the world. Thoothukudi was established as a Municipality in 1866 and on August 5, 2008 attained the status of Corporation after 142 years. Thoothukudi District is located in the extreme south-eastern corner of Tamil Nadu State, between 8° and 22' to 9° and 22' North Latitude and 77°40' and 78° East Longitude.The district has five major types of soils namely red loam, lateritic, black cotton, sandy coastal alluvium and red sandy soil. The annual rainfall is below 700 mm and more than 80 per cent of area is comes under the rainfed. North east monsoon is the major rainfall season and if north east monsoon fails then the area under cultivation will be reduced drastically.

Paddy was the major crop grown in the district followed by pulses, cholam and cumbu. Thoothukudi District Agriculture Plan for the Twelfth Plan Period (2017-22) has been prepared and the salient features of the District Agriculture Plan are discussed below.

Table 4.26. Budget Abstract for Thoothukudi District

(₹ in lakhs)

Sl. No	Sectors	2017-18	2018-19	2019-20	2020-21	2021-22	Total
1	Agriculture	3259.80	7540.82	3974.47	4558.18	4341.15	23674.42
2	Agricultural Research (TNAU)	496.00	320.00	120.00	10.00	20.00	966.00
3	Horticulture	1395.71	1368.15	1492.25	1565.52	1589.24	7410.87
4	Agricultural Engineering	969.27	1141.42	1088.90	1442.36	1369.06	6011.01
5	Agricultural Marketing	2789.14	671.44	309.90	229.04	257.00	4256.52
6	Seed Certification and Organic Certification	23.36	14.56	1.20	1.20	1.20	41.52
7	Animal Husbandry	767.05	846.05	686.05	557.05	621.05	3477.25
8	Animal Sciences Research (TANUVAS)	0.00	0.00	0.00	0.00	0.00	0.00
9	Dairy Development	449.25	790.25	740.25	449.25	459.25	2888.25
10	Fisheries	60.09	60.09	60.09	60.09	1710.09	1950.45
11	Fisheries Research (TNFU)	4980.73	2185.93	1493.73	428.73	240.73	9329.85
12	Public Welfare Department (WRO)	9463.33	8626.33	8613.33	1588.30	1736.00	30027.29
13	Civil Supplies &Co operation	199.30	135.50	103.50	142.50	109.00	689.80
	Total	**24853.03**	**23700.54**	**18683.67**	**11032.22**	**12453.77**	**90723.23**

The total budget requirement for the implementation of various interventions by different department is ₹. **90723.23** lakhs

CHAPTER I

INTRODUCTION

Rashtriya Krishi Vikas Yojana (RKVY) vis-à-vis National Agricultural Development Program (NADP) was initiated in 2007 as an umbrella scheme for ensuring holistic development of agriculture and allied sectors by allowing states to choose their own agriculture and allied sector development activities. The scheme has come a long way since its inception and has been implemented across two plan periods i.e. during 11th and 12th plan periods. Based on feedback received from States, experiences garnered and inputs provided by various stakeholders, schemes eligible for funding under RKVY have undergone modifications to enhance efficiency, efficacy and inclusiveness of the program.

The overall objectives of RKVY (NADP) are as follows:

Objectives of RKVY

a. To strengthen the farmers' efforts through creation of required pre and post-harvest agri-infrastructure that increases access to quality inputs, storage, market facilities etc. and enable farmers to make informed choices.

b. To provide autonomy, flexibility to States to plan and execute schemes as per local/ farmers' needs.

c. To promote value chain addition linked production models that will help farmers increase their income as well as encourage production/productivity

d. To mitigate risk of farmers with focus on additional income generation activities - like integrated farming, mushroom cultivation, bee keeping, aromatic plant cultivation, floriculture etc.

e. To attend national priorities through several sub-schemes.

f. To empower youth through skill development, innovation and agri-entrepreneurship based agribusiness models that attract them to agriculture.

District and State Agriculture Plans

As per the recent guidelines issued by the Government of India under Remunerative Approaches for Agriculture and Allied sector Rejuvenation (RAFTAAR), the new projects proposed and are to be implemented under NADP/RKVY must be in consonant with District Agricultural Plans (DAP), State Agriculture Plans (SAP) and State Agriculture Infrastructure Development Program (SAIDP) prepared by the

individual States. Thus, such action-oriented plan documents will remain as a cornerstone of planning and implementation of the NADP/RKVY and other schemes.

The overall guidelines suggested by the Government of India to be followed for preparation of District Agriculture Plans (DAP) and State Agricultural under NADP/RKVY are as follows:

- The several states have already prepared Comprehensive District and State Agriculture plans for 12th Plan period. These plans have to be revised and updated appropriately for implementing RKVY-RAFTAAR during 14th Finance Commission keeping in view modification proposed for the plan period and emerging needs of the State.
- The District Agriculture Plan (DAP) shall not be however the usual aggregation of existing schemes but would aim at moving towards projecting the requirements for development of Agriculture and allied sectors of the district and for the State a whole.
- These plans would also present the vision for Agriculture and allied sectors within the overall development perspective of the district and further State as a whole.
- The District Agriculture Plans and the State level plan would also present their financial requirements in addition to sources of financing the agriculture development plans in a comprehensive way.
- The District Agriculture Plan will include animal husbandry and fishery development, minor irrigation projects, rural development works, agricultural marketing schemes and etc. keeping in view the natural resources and technological possibilities in each district.
- District level potential linked credit plans (PLP) already prepared by the National Bank for Agriculture and Rural Development (NABARD) and Strategic Research and Extension Plans (SREP) developed under the Agricultural Technology Management Agency (ATMA) etc. may be referred for revision of DAPs.
- It should also be ensured that the strategies for convergences with other programs as well as the role assigned to the Panchayati Raj Institutions (PRIs) are appropriately incorporated in DAPs.

Therefore, each State will also have a comprehensive State Agricultural Plan (SAP) for the remaining period of the Fourteenth Finance Commission by

integrating the District Plans. SAPs will invariably have to indicate resources that can flow from the State to the districts.

The Process

Revision and updating of SAPs could be a two-way process. Firstly, State Nodal Department (or Agriculture Department) could get DAPs revised in the first instance to ensure that priorities of the State are properly covered in the district plans. States should, at this stage of scrutiny, ensure that requirements of districts and priorities of the State are appropriately captured and aligned in DAPs. Alternately, State Nodal Agency could communicate to the districts in the first instance, the State's priorities that ought to be reflected in the respective district plans and the districts may incorporate these in their updated district plans. Preparation/revision of the DAPs need to be an elaborate, exhaustive and iterative process and care has to be taken by the State Nodal department and District Agriculture Department in ensuring that these plans cover the entire gamut of agriculture and allied sectors.

Revision and Updation of DAP and SAP in Tamil Nadu

Tamil Nadu State continued to receive Central Assistance under NADP/RKVY. The Government of Tamil Nadu also prepared District and State Agriculture Plans covering 11th and 12th Plan periods. Tamil Nadu State has 32 districts including Chennai. The District Agriculture Plan were prepared for 31 districts excluding Chennai during 12th plan period. Thus, the current exercise is the continuation of the 12th plan period: which also covered two years of the 14th Finance Commission period (2015-16 and 2016-17) and also keeping in view of the changing scenario in the development and emerging needs of the State and to be eligible for fresh grants from Government of India. These plans were further revised and updated appropriately for implementing RKVY during the periods from 2017-18 to 2021-22.

Methodology followed

The revision of the District Agricultural Plan of Thoothukudi district, was done by gathering the secondary data about district and block with respect to rainfall, land use pattern, demography, livestock, machinery, infrastructure so far created etc. In addition, the constraints in production and marketing of agricultural and livestock produce, crop/animal production and gaps between expected and actual yield and the reasons for such gaps were also discussed among the various stakeholders and incorporated in this plan document. Besides, in consultation with the line department officials and based on the data received from respective districts, a detailed year-wise action plan i.e. from 2017-18 to 2021-22 with physical and financial implications were presented.

CHAPTER II

PROFILE OF THE DISTRICT

2.1. Thoothukudi at a Glance

Thoothukudi district was carved out of the erstwhile Tirunelveli district on October 20, 1986. Thoothukudi was a major natural pearl fishing center till last century. It has one of the oldest ports in the world. The lighthouse built in 1842 marked the beginning of Thoothukudi's harbour development. India' independence struggle has strong links with Thoothukudi. Notable freedom fighters like SubramaniyaBharathi, V. O. Chidambaram, Vanchinathan and VeerapandiaKattabomman hailed from Thoothukudi.

The district has also been the headquarters of prominent missionaries like G.U. Pope, Veeramamunivar and Caldwell, who besides their missionary work, also contributed to the development of Tamil language and literature. Thoothukudi was established as a Municipality in 1866 and on August 5, 2008 attained the status of Corporation after 142 years.

2.2. Area and Geographical Location

Thoothukudi District is located in the extreme south-eastern corner of Tamil Nadu State, between 8° and 22' to 9° and 22' North Latitude and 77°40' and 78° East Longitude. It is bounded on the north by the districts of Tirunelveli, Virudhunagar, and Ramanathapuram, on the east and south-east by the Gulf of Mannarand on the west and southwest by Tirunelveli district.

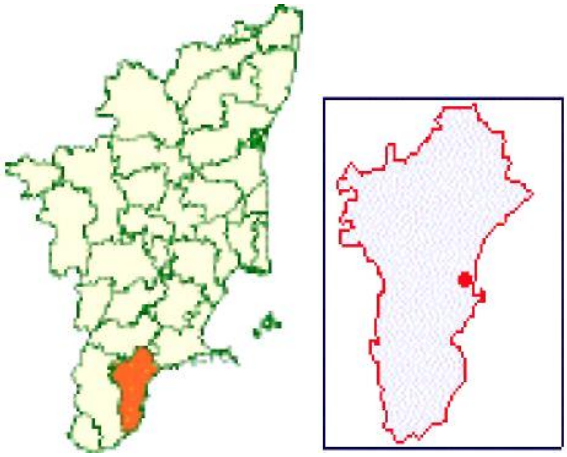

Fig.1. Location of Thoothukudi District in Tamil Nadu

2.3. Administrative Structure of Thoothukudi District

For revenue administration, the district is divided into three Revenue Divisions as Thoothukkudi, Tiruchendur and Kovilpatti. Thoothukudi district is divided into eight taluks*viz*., Thoothukudi, Thiruchendur, Kovilpatti, Sathankulam, Srivaikundam, Vilathikulam, Ottaipidaram and Ettayapuram totally comprising of 480 revenue villages on the whole. The district has twelve blocks.

Fig.2. Thoothukudi District Map Indicating the Taluks

The district comprises of eight taluks, and 480 revenue villages. The details are given in Table 2.1.

Table. 2.1 Administrative Profile of Thoothukudi District

District	Taluks	Revenue Villages	Blocks	Panchayat Villages
Thoothukudi			Thoothukudi	25
			Karungulam	31
	Thoothukudi	33	Srivaikundam	31
	Kovilpatti	87	Alwarthirunagari	30
	Ottaipidaram	63	Tiruchendur	11
	Sathankulam	25	Udangudi	17
	Srivaikudam	69	Sathankulam	24
	Ettayapuram	56	Kovilpatti	38
	Tiruchendur	58	Kayathar	45
	Vilathikulam	89	Ottapidaram	61
			Vilathikulam	51
			Pudur	44

Source: Census of India (2011), Block wise Primary Abstract Data (PCA) – Thoothukudi.

Revenue Firkas : 40

Revenue Villages : 480

For the purpose of election, this district is divided into 8

Assembly constituencies and Parliamentary Constituencies of the districts are

1. Parliamentary Constituencies

- Tirunelveli
- Tiruchendur and
- Sivakasi

2. Assembly Constituencies

- Vilathikulam,
- Ottapidaram,
- Kovilpatti,
- Sattankulam,
- Tiruchendur,
- Srivaikuntam and
- Thoothukudi.

The local bodies and their numbers in the district are detailed below.

Corporation	:	1
Municipalities	:	1
Panchayat Unions	:	12
Town Panchayats	:	19
Village Panchayats	:	408
Revenue Firkas	:	41
Revenue Villages	:	480

2.4. Demographic profile

2.4.1. Population

Thoothukudi district has a total population of 1750176 (2011 census). The taluk-wise male and female population is given in the table.

In 2011, Thoothukudi had population of 1,75,0176 of which males and females were 865021 and 885155 respectively. In 2001 census, Thoothukudi had a population of 1571273 of which males were 766823 and the remaining 805450 were females.

Table 2.2 Thoothukudi Population Details (Numbers)

1	Population	District	Percentage
	Total person	1750176	100.0
	Males	865021	49.4
	Female	885155	50.6
	Rural		
	Person	873374	49.9
	Male	430361	49.2
	Female	443013	50.7
	Urban		

1	Population	District	Percentage
	Person	876,802	50.1
	Male	434,660	49.6
	Female	442,142	50.4
2	**Area (in. sq km.)**	4745	
	Density of Population (Person per sq. km.)	369	
3	**Sex Ratio**		
	Total	1023	
	Urban	1029	
	Rural	1000	1017

Source: Census of India (2011), Block wise Primary Abstract Data (PCA) – Thoothukudi.

With regard to sex ratio in Thoothkudi district, it stood at 1023 per 1000 male. The average national sex ratio in India is 940 as per the latest Census reports of 2011.. In 2011, child sex ratio was 963 girls per 1000 boys. In census enumeration, data regarding child under 0-14 age were also collected for all districts including Thoothukudi. There were in all 4,31,881 children under age of 0-14 in 2011 census. Of the total of 1,83,763, male and female were 93,605 and 90,158 respectively. Child sex ratio as per census 2011 was 956 as compared to 939 of census 2011. The demographic details of Thoothukudi district are furnished in Table. 2.2. It could be seen that males accounted for 49.2 per cent of the total population of the district in rural areas. Further population in the urban areas were relatively high as compared to rural areas. As regards sex wise distribution of population, females were found to be high in rural areas (50.7 per cent) than in urban areas (50.4 per cent).

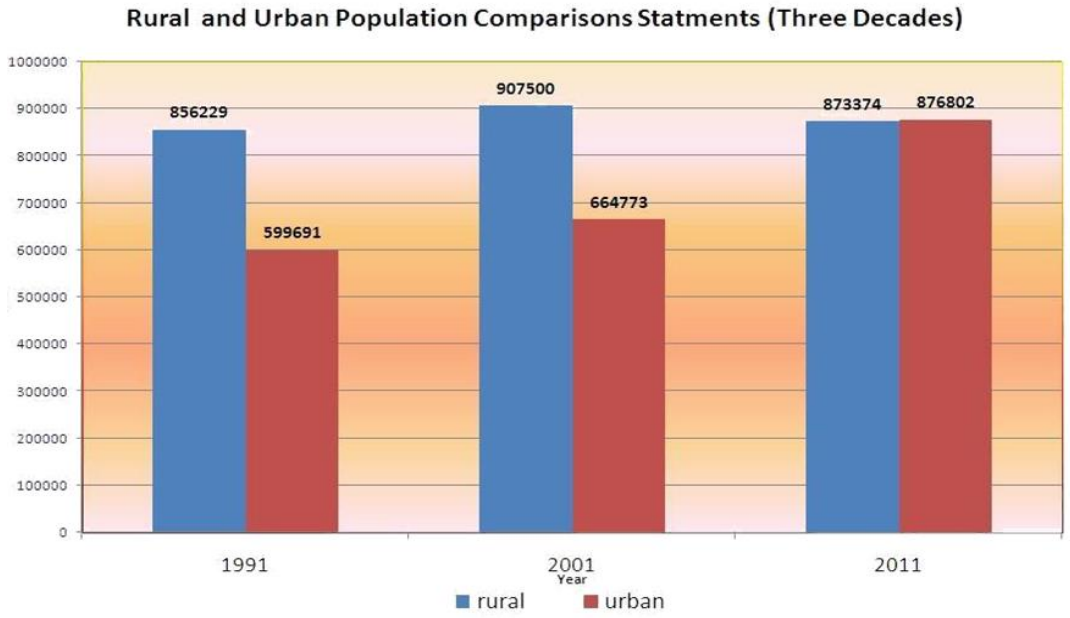

Fig.3. Rural and Urban Population Comparisons Statements (Three Decades)

2.4.2. Literacy Level inThoothukudi District

Table 2.3 Literacy Level inThoothukudi District

Description	Number of persons	Literacy rate (%)
Total literates	1349697	77.1
Male literates	703106	52.0
Female literates	64659	147.9

Source: Census of India (2011), Block wise Primary Abstract Data (PCA) – Thoothukudi.

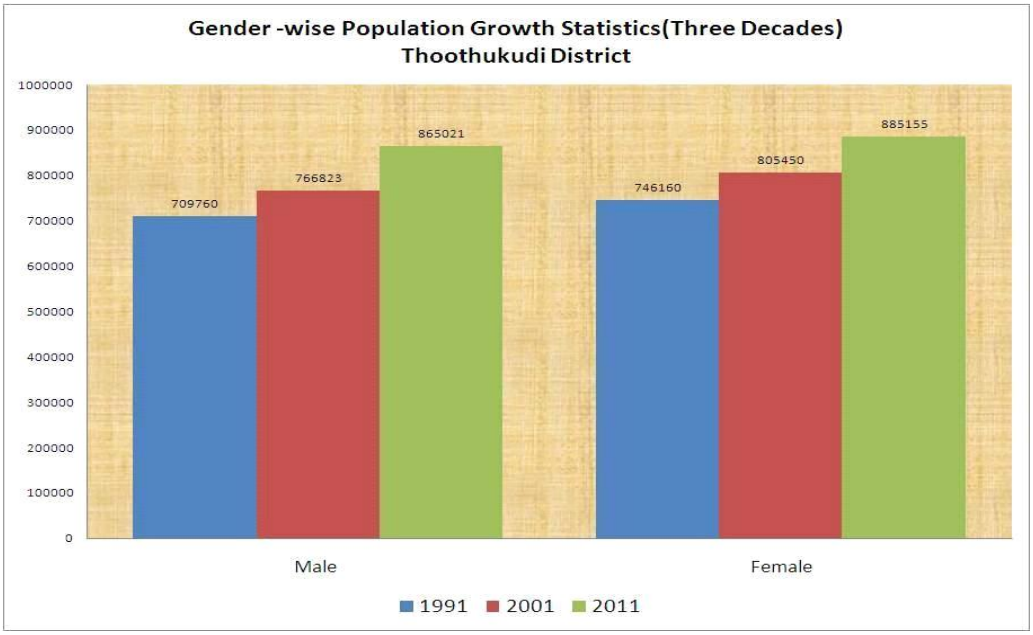

Fig. 4. Gender Wise Population Growth Statistic (Three decades), Thoothukudi

Source: District Statistical hand book, Thoothukudi

2.4.3. Working population

Table 2.4 Occupational Classification of Population in Thoothukudi District

Description	Number	Percentage
Total workers	748095	42.74
Total main workers	657447	37.56
Marginal workers	90648	5.18
Cultivators	48515	6.49
Agricultural labourers	200644	26.82
Household industries	22863	3.06
Other workers	476073	63.64

Source: Census of India (2011), Block wise Primary Abstract Data (PCA) – Thoothukudi.

The details of occupational classification of population in the district are presented in the Table.2.4. Among the total work force in the district more than 42.74 per cent were main workers comprising of cultivators (6.49 per cent), agricultural labourers (26.82 per cent), other workers (63.64 per cent) and those engaged in household industries (3.06 per cent). The marginal workers accounted for about 5.18 per cent of the total working force in the district and the non-workers accounted for about 46.90 per cent of the total population in the district.

2.5 Topography

The major soil types found in the district include, vertisols, alfisols and inceptisols. Deep fine, montmorillonitic vertisols occupy a major area of 1,14,817.11 ha.

2.5.1 Soil type

The district has five major types of soil types namely red loam in Udangudi, Kayatar and Sattankulam places. Lateritic type of soil is prevalent in Srivaikundam and Tiruchendur areas. Major areas of Kovilpatti, parts of Kayatar, Vilathikulam, Thoothukudi and Ottapidaram covered by black cotton soil. Sandy coastal alluvium type of soil is present in parts of Tiruchendur and red sandy soil is prevalent in Udangudi, Sattankulam, Srivaikundam, Karungulam, Ottapidaram and Vembar areas.

Table 2.5 Soil Types of Thoothukudi District

Type of Soil	Places in District
Red Loam	Udangudi, Kayatar, Sattankulam
Lateritic Soil	Srivaikuntam, Tiruchendur
Black Soil	Kovilpatti, Kayatar, Vilathikulam, Thoothukudi and Ottapidaram
Sandy Coastal Alluvium	Tiruchendur,
Red Sandy Soil	Udangudi, Sattankulam, Srivaikuntam, Karungulam, Ottapidaram, Vembar

Source: District statistical handbook- Assistant Director of Statistics, Thoothukudi

2.6.Climatic condition and Rainfall

More than 80 per cent of area comes under rainfed condition. The annual rainfall is below 790.2 mm. North East Monsoon is the major rainfall season and the district receives more than 74 per cent of rainfall during this season. If North East Monsoon is failure the area under cultivation will be reduced drastically. This is a major problem in Thoothukudi district.

Table 2.6 Monthwise / Seasonwise Rainfall Distribution in Thoothukudi District

Season / Month	2014-15	
	Actual (mm)	Normal (mm)
South West Monsoon		
June	7.8	7.1
July	2	15.9
August	20	15.8
September	22.1	36.1
Total	**51.9 (6.57)**	**74.9 (11.41)**
North East Monsoon		
October	334.7	151.3
November	186.9	185.4
December	64	90.3
Total	**585.6 (74.11)**	**427 (65.06)**
Winter Season		
January	2.4	24.6
February	7.2	18.2
Total	**9.6 (1.21)**	**42.8 (6.52)**
Hot Weather		
March	33.5	29.1
April	41.2	51.5
May	68.4	31
Total	**143.1 (18.11)**	**111.6 (17.00)**
Annual Rainfall	**790.2 (100.00)**	**656.3 (100.00)**

Source: Season and Crop Report 2014-15, Tamil Nadu

The month-wise and season wise rainfall distribution in Thoothukudi district in 2014-15 is presented in Table 2.6. The normal rainfall of the district is 656.30 mm. North East monsoon sets during October – November and by December the rains excess than normal rainfall in the year 2015. The district receives North east monsoon rainfall totally 585.6 mm and normal rainfall in this season is 427 mm. The actual rainfall received in 2014-15 was 790.2 mm.

Table 2.7 Rainfall of Thoothukudi District (2004-05 to 2014-15) (in mm)

Year	South West Monsoon		North East Monsoon		Winter Season		Hot weather Season		Total		Deviation (%)
	Normal	Actual	Normal	Actual	Normal	Actual	Normal	Actual	Normal	Actual	
2004-2005	86.8	151.1	410.1	551.4	46.6	61.5	112.2	171.1	665.7	935.1	+42.6
2005-2006	86.8	48.4	410.1	453.6	46.6	36.1	112.2	139.9	665.7	678.0	+3.4
2006-2007	86.8	62.0	410.1	670.6	46.6	40.2	112.2	64.4	665.7	837.2	+27.7
2007-2008	86.8	101.7	410.1	370.4	46.6	94.9	112.2	323.9	655.7	890.9	+35.8
2008-2009	86.8	65.7	410.1	584.10	46.6	7.0	112.2	113.3	655.7	770.1	+17.45
2009-2010	86.8	54.5	410.1	490.5	46.6	23.3	112.2	66.4	655.7	634.7	-3.20
2010-2011	86.8	109.5	410.1	523.5	42.8	13.7	111.6	46.0	651.3	692.7	+64
2011-2012	30.3	74.9	550.9	427	16.2	42.8	72.8	111.6	670.2	656.3	2.1
2012-2013	74.9	0.4	427	330.4	42.8	45.5	111.6	49.9	656.3	426.2	-35
2013-2014	74.9	13.8	427	301.6	42.8	31.4	111.6	159.4	656.3	506.2	-22.9
2014-2015	74.9	51.9	427	585.6	42.8	9.6	111.6	143.1	656.3	790.2	20.4

Source: Department of Economics and Statistics, Chennai-6.

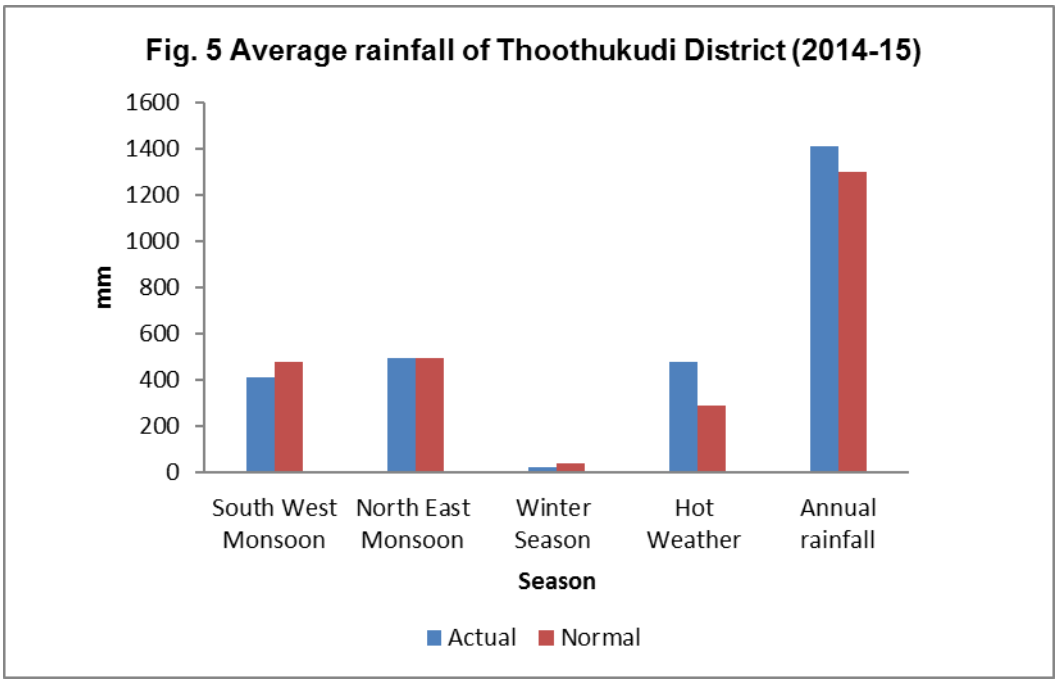

Fig.5. Average Rainfall Graph (2014-15)

Table 2.8 Temperature and Humidity at Thoothukudi District

Month	Temp. (Degree Celsius)		Pressure (Milli Bar)		Humidity	
	Maximum	Minimum	Maximum	Minimum	Maximum	Minimum
(1)	(2)	(3)	(4)	(5)	(6)	(7)
2014	39.8	28.4	1009.1	999.8	92	41
July	39.1	28.4	1010.0	1001.3	93	41
August	37.1	27.4	1010.5	1002.3	100	47
September	38.1	25.4	1012.8	1002.0	98	47
October	37.0	24.2	1013.7	1002.4	100	34
November	32.3	23.5	1013.2	1005.5	100	52
December	32.1	23.5	1014.2	1004.0	99	68
January-2015	30.9	22.4	1018.5	1006.0	100	56
February	32.0	23.0	1017.2	1006.6	100	53
March	33.6	25.0	1015.0	1006.1	98	60
April	33.1	24.1	1013.9	1002.4	98	62
May	35.5	23.8	1010.2	1002.1	94	91

Source: Scientific Officer, Meteorological Observatory, Tuticorin Port Trust

Month-wise mean maximum and mean minimum temperature in Thoothukudi district is presented in Table 2.8. In May month, the maximum and minimum temperature in the district is 35.5ºC and 23.8ºC, respectively.

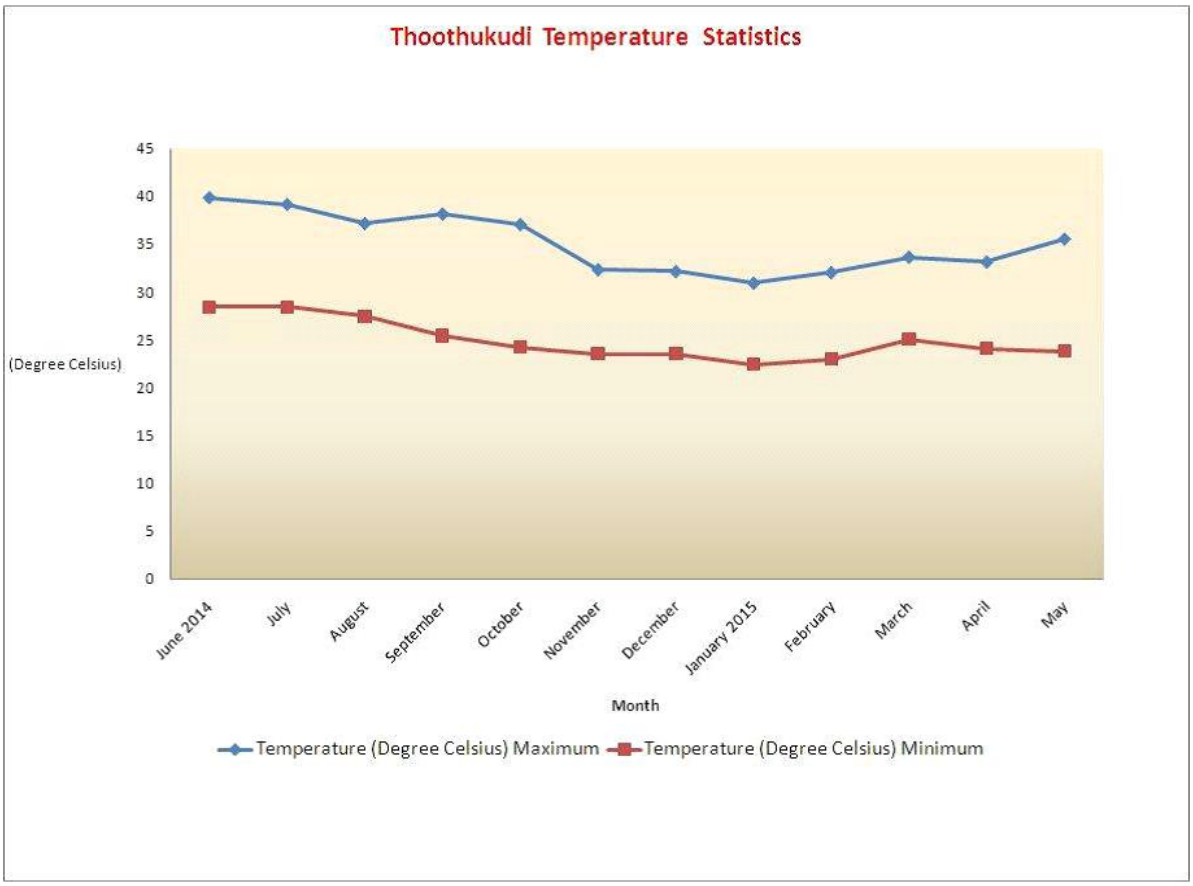

Fig.6.Thoothukudi Temperature graph

2.7. Land

The major soil types found in the district include Vertisols, Alfisols and Inceptisols. Deep fine, montmorillonitic, vertisols occupies a major area of 1, 14,817.11 ha. The types of soil and the area are listed in Table 2.9 below.

2.7.1. Land and its Type

The total geographical area of the district is 4,70,724 hectares. In 2014-15 1,97,695 hectares have been brought under cultivation as net area sown. This accounted for 42 per cent of the total area of the district. Area sown more than once was 3128 hectares. Total cropped area was 2,00,823 hectares. Forests accounted for 11,021 hectares and formed 2.34 per cent of the total area. 16.25 per cent of the total area was put to non-agricultural use (76,480 hectares). However, 2.18 per cent of the area accounted for current fallow lands (10,260 hectares) (Table 2.10).

Table 2.9 Major soil types in Thoothukudi district

Sl.No.	Type ofSoil	Places in District
1	RedLoam	Udangudi, Kayatar, Sattankulam
2	Lateritic Soil	Srivaikuntam,Tiruchendur
3	Black Soil	Kovilpatti,Kayatar,Vilathikulam, Thoothukudiand Ottapidaram
4	SandyCoastalAlluvium	Tiruchendur,
5	RedSandySoil	Udangudi,Sattankulam,Srivaikuntam,Karungulam, Ottapidaram,Vembar

Source: Department of Economics and Statistics, Chennai.-6

2.7.1. Land Use Pattern (2014-15)

Table 2.10. Land Use Pattern of Thoothukudi District (2014-15) and Compound Growth Rates (2000-01 to 2014-15) per annum

Sl.No.	Classification	Area (ha)	Per cent	CGR (%)
1	Geographical Area	470724	100.00	0.00
2	Forest	11012	2.34	0.07
3	Barren & Unculturable Area	19878	4.22	0.51
4	Land Put to Non-agricultural Uses	76480	16.25	2.14
5	Permanent Pastures & Other grazing lands	5132	1.09	0.00
6	Misc.tree crops & groves not incl. in the net area sown	36597	7.77	-1.12
7	Current Fallow	10260	2.18	0.39
8	Other Fallow	68428	14.54	1.05
9	Net area sown	197695	42.00	1.49
10	Area sown more than once	3128	0.66	0.31
11	Gross area sown	200823	42.66	5.73

Source: Season and Crop Report 2014-15, Tamil Nadu

The growth rate analysis indicated that the cultivable waste land increased at 2.14 per cent during the period from 2000-01 to 2014-15 and it is not a good sign. However, the current fallows and other fallow lands exhibited a positive growth rate during the period under consideration. Net area sown had also exhibited a positive growth rate and thus had equally reflected in the gross cropped area as well. This clearly calls for identifying the challenges in agriculture and the steps to be taken up for converting the challenges into opportunities.

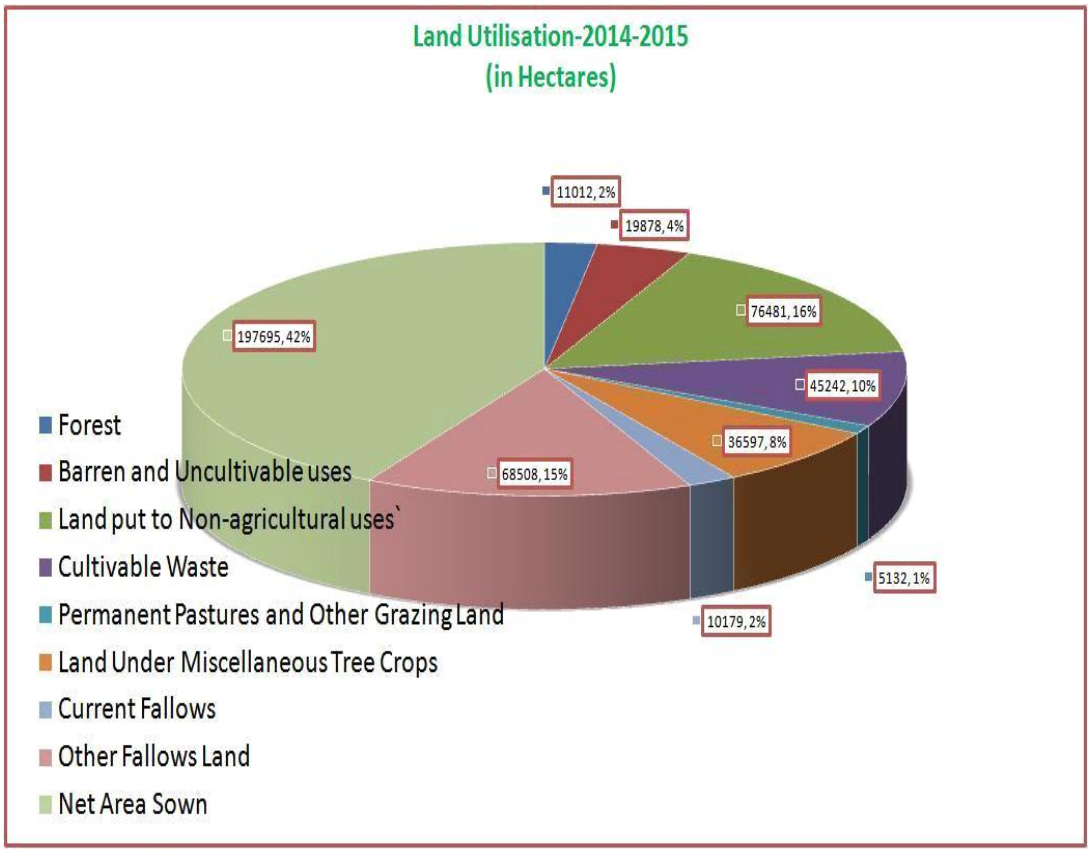

Fig.7. Land Utilization (2014-15)

2.7.2 Number and Area of Operational Land Holdings

The number and size operational land holding of the farmers is presented below in Table 2.11.

Table 2.11 Number and Area of Operational Land Holdings

Size class of holding (ha)	Number				Area			
	SC	ST	Other	Total	SC	ST	Other	Total
1	2	3	4	5	6	7	8	9
Below 0.5	14440	-	71857	86297	3517	-	17732	21249
0.5-1.0	7603	-	34581	42184	5455	-	24938	30393
1.0-2.0	6032	-	30311	36343	8236	-	42820	51056
2.0-3.0	1994	-	11812	13806	4827	-	28687	33514
3.0-4.0	804	-	6002	6806	2767	-	20616	23383
4.0-5.0	403	-	3278	3681	1794	-	14562	16356
5.0-7.5	382	-	3495	3877	2280	-	20857	23137
7.5-10.0	105		1389	1494	911		11820	12731
10.0-20.0	66	-	1129	1195	860	-	14866	15726
20 & above	4	-	189	193	165		6133	6298
Total	**31833**	**-**	**164043**	**195876**	**30812**	**-**	**203031**	**233843**

Source: 9th Agricultural Census, 2010-2011

It is inferred from the above table 2.11 that 86297 farmers are falling under the category of below 0.5 hectare land holding size.

The land holdings pattern in Thoothukudi district is given in Table 2.11. It could be seen that the small holdings with a size of less than two hectares formed 65.59 per cent of total number of holdings and accounted for 22.08 per cent of the land area owned. On the contrary, the relatively larger land holdings with a size of more than 20 hectares accounted for about 0.5 per cent of the total number of holdings in the district with more than 2.6 per cent of the total land owned in the district.

2.8 Sources of Irrigation

The various sources of irrigation and the area irrigated in the district are indicated below.

Table 2.12 Various Irrigation Sources in Thoothukudi district

Year 2014- 15

Sl.No.	Name of the district	Canals in nos.	Length of Km	Well used for irrigation purpose& bore well	Tube well	Well used domestic purpose only	Reservoirs	Tanks Nos.
1	Thoothukudi	4	78.04	22200	578	8357	--	651

Source: Assistant Director of Statistics, Thoothukudi

There are about 651 tanks, 578 tube well and four canal present in Thoothukudi district

B. Ground Water Potential

Three types of ground water classifications are seen in the district. The ground water potential is very high in Vilathikulam block followed by Alwarthirunagari. Thiruchendur having the lowest ground water potential. The details of block-wise ground water potential are presented in Table 2.13 below.

Table 2.13 Ground Water Potential in Thoothukudi District

Sl. No.	Block	Potential	Utilisation (ha)	Balance in ac. ft.	Classification	Ground water classification	% G.W. Extraction
1.	Kovilpatti	4105	2618	1487	Grey	Grey	65% to 85% exploited
2.	Srivaikundam	2258	511	1747	Grey		
3.	Kayathar	5357	2649	2708	White	White	Below 65% exploited
4.	Pudur	3735	991	2744	White		
5.	Ottapidaram	5981	2685	3296	White		
6.	Thiruchendur	926	643	283	Grey		
7.	Alwarthirunagari	7258	1090	6168	White		
8.	Karungulam	4570	1524	3046	White		
9.	Thoothukudi	4581	544	4037	White		
10.	Vilathikulam	8494	883	7611	D	Dark	above 85% exploited
11.	Udangudi	2338	1534	804	D		
12.	Sattankulam	3218	2446	772	D		
	Total	**52821**	**18118**	**34703**			

Source: Assistant Director of Statistics, Thoothukudi

Table 2.14 Details of Dams in Thoothukudi District

Name ofthe District	Dams					Tanks	No.of Wells inuse	No.of Bore wells
	Catch-ment area	Water spread area	Height	Capacity	Length of canals	Length of canals		
Thoothukudi	--	--	--	--	--	78.04	22778	93

Source: Assistant Director of Statistics, Thoothukudi

From the Table 2.14 It is evident that there are about 93 bore wells and 22778 wells are in use in Thoothukudi district.

Table 2.15 Irrigation by Different Sources in Thoothukudi District (2014-15)

(Hectares)

Sl.No.	Particulars		2012-13	2013-14	2014-15	Average
1	Canals	Gross	10745	15391	14991	13709.00
		Net	9677	12611	13162	11816.67
2	Tanks	Gross	3918	4200	7111	5076.33
		Net	3918	4110	6808	4945.33
3	Tube wells / Bore wells	Gross	710	468	345	507.67
		Net	710	468	336	504.67
4	Open wells	Gross	15409	15054	16908	15790.33
		Net	15316	15052	16841	15736.33
5	Other Sources	Gross	108	122	0	76.67
		Net	108	122	0	76.67

Source: Season and Crop Report 2014-15, Tamil Nadu

Information on source wise area irrigated in Thoothukudi district is provided in Table 2.15. Wells and canals were found to be the major source of irrigation of gross area irrigated in 2014-15. Next to tanks formed an important source of the gross area irrigated during the period under consideration. Borewells accounted for the remaining gross area irrigated in the district.

Table 2.16 Cropping Area under Irrigation (2014-15)

Sl.No.	Crop	Area (ha)
1.	Paddy	16281
2.	Cholam	137
3.	Cumbu	61
4.	Maize	505
5.	Ragi	-----
6.	Greengram	28
7.	Blackgram	177
8.	Chilies	492
9.	Sugarcane	97
10.	Onion	127
11.	Gingelly	5
12.	Groundnut	143
13.	Coconut	6032
14	Banana	9185

Source: G - Return-2014-2015

Table 2.16 shows the cropping area under irrigation of major crops in Thoothukudi district. From the above table it's evident that paddy occupied a major area about 16281 ha followed by banana (9185 ha) and by coconut (6032 ha). The least cropping area under irrigation was occupied by gingelly was about 5 ha.

2.9 Cropping Pattern

2.9.1. Major crops

Major crops cultivated in Thoothukudi district are Paddy, Blackgram, Greengram, Maize, Cumbu, Banana, Chilies, Cholam, Coconut, Cotton, Sunflower, Vegetables, Gingelly, Groundnut and Onion. Though noted for trade and industry, the district is by no means backward in the field of agriculture. Added to this was the propaganda and demonstration organized by the Agricultural Department. Availability of irrigation facilities coupled with the awareness of improved methods of farming helped the agriculturists to forge ahead.

2.9.2 Area under Different Crops

The details of area under major crops for the period triennium ending 2014-15 are given in Table 2.17. Most of the cereal crop varieties cultivated in the district is those released by Tamil Nadu Agricultural University. However, in crops such as sunflower, maize and vegetable crops, private varieties were found to dominate. Sunflower, maize and tapioca are relatively newer crops in the district and area under these crops is gaining momentum due to their lesser labour requirement and low cost of cultivation.

Table 2.17 Area, production and productivity under major crops (Triennium ending 2014-15)

Sl.No	Particulars	Area (in ha)	Production (in tonnes)	Productivity (in kg/ha)
1	Paddy	11415.00	54645.67	4787.18
2	Maize	27467.33	62885.67	2289.47
3	Cholam	14274.67	29733.00	2082.92
4	Cumbu	12617.00	21819.67	1729.38
5	Ragi	77.67	302.67	3896.87
6	Bengal Gram	30.33	17.33	571.381
7	Red Gram	203.00	215.00	1059.11
8	Black Gram	29267.33	13475.67	460.43
9	Green Gram	22449.00	18789.00	836.96
10	Horse Gram	4.67	3.00	642.39
11	Groundnut	616.67	1795.00	2910.79
12	Sunflower	2428.67	1592.00	655.50
13	Gingelly	798.67	170.33	213.26
14	Castor	30.33	2.67	88.03
15	Cotton	5212.67	15663.00	3004.79
16	Coconut	5920.33	539.00	91.042
17	Sugarcane	253.00	25404.33	100412.4
18	Onion	1299.33	6398.33	4924.33
19	Brinjal	142.33	1284.67	9025.99
20	Bhendi	157.67	1166.33	7397.28
21	Cabbage	0.33	20.33	61606.06
22	Tomato	146.67	2003.33	13658.76
23	Banana	9361.67	390375.00	41699.29
24	Mango	772.33	5275.67	6830.85
25	Jack Fruit	6.33	83.67	13218.01
26	Guava	247.33	1505.67	6087.697
27	Grapes	3.00	44.33	14776.67
28	Orange	2.33	6.00	2575.10
29	Chillies	11083.33	3349.33	302.1953
30	Pepper	10.00	0.33	33
31	Coriander	2694.00	749.67	278.2739
32	Turmeric	4.00	85.33	21332.5
33	Tamarind	359.33	831.67	2314.50
34	Tapioca	25.33	839.67	33149.23
35	Sweet Potato	21.33	381.33	17877.64
	Total	**159403.00**	**661453.67**	

Source: Season and Crop Report 2014-15, Tamil Nadu

Table 2.18 Block wise Cropping Pattern

Sl. No	Block	Season	Cropping pattern	Crops
1	Thoothukudi	*Kharif*/Early *Kar*	Monocropping	Paddy
		Rabi/Samba/Pisanam	Monocropping	Paddy Pulses Fodder Cholam Banana
2	Srivaikundam	*Kharif*/Early Kar	Monocropping	Paddy
		Rabi/Samba/Pisanam	Monocropping	Paddy followed by Rice fallow pulses banana
		Summer/*Navarai*/Kodai		Paddy
3	Karunkulam	*Kharif*/Early kar	Monocropping	Paddy
		Rabi/Pisanam/samba	Monocropping	Paddy Pulses Cotton Vegetables/Flowers
4	Thiruchendur	*Kharif*-Early kar	Monocropping	Paddy
		Rabi/Samba/Pisanam	Monocropping	Paddy Banana
5	Udangudi	*Kharif* *Rabi*	Monocropping Monocropping	Groundnut Groundnut Paddy
6	Alvarthirunagari	*Kharif*/Early Kar	Monocropping	Paddy
		Rabi/Samba/Pisanam	Monocropping	Paddy followed by Rice fallow pulses Paddy
		Summer/*Navarai*/Kodai		Paddy
7	Sathankulam	*Kharif*	Monocropping	Paddy Groundnut
		Rabi	Monocropping	Paddy Groundnut
8	Ottapidaram	*Kharif* *Rabi*	No cropping Monocropping	Fodder Cholam Cholam Cumbu Maize Pulses Cotton Vegetable
			Mixed cropping	Cotton+Pulses Cumbu+Pulses (Rarely)
9	Kovilpatti	*Kharif*	No cropping	
		Rabi	Monocropping Mixed cropping	Fodder Cholam Cholam Cumbu Maize Pulses Cotton Chilies Coriander Cotton+Pulses

Sl. No	Block	Season	Cropping pattern	Crops
10	Kayatar	*Kharif* *Rabi*	No cropping Monocropping	Fodder Cholam Cholam Cumbu Maize Pulses Cotton
			Mixed cropping	Cotton+Pulses
11	Villathikulam	*Kharif*	No cropping	
		Rabi	Monocropping	Fodder Cholam Cholam Cumbu Maize Pulses Cotton Chilies Coriander
			Mixed cropping	Cotton+Pulses
12	Pudhur	*Kharif*	No cropping	
		Rabi	Monocropping	Fodder Cholam Cholam Cumbu Maize Pulses Cotton Chilies Coriander
			Mixed cropping	Cotton+Pulses

Source: Joint Director of Agriculture office, Thoothukudi

2.10. Consumption of Chemical Fertilizers and Pesticides

Table 2.19 Consumption of Chemical Fertilizers and Pesticides (2014-15)

Fertilizers(in'000'tonnes)				Pesticides		Urea ('000' tonnes)
Nitrogenous (N)	Phosphatic (P_2O_5)	Pottassic (K_2O)	Total (NPK)	Dust (kg)	Liquid (l)	
9.630	5.039	2.324	16.993	10.800	36000	13.700

Source: District Statistical Handbook 2014-15.

The details of fertilizers and pesticides consumption in the district during the year 2014-15 are furnished in Table 2.19. It could be seen from the table that 16.993 tonnes of nitrogenous, phosphatic and potassic fertilizers were consumed in Thoothukudi district during 2014-15. Similarly 10.800 tonnes of dust formulation of pesticides and urea were used in 2014-15. Further 36,000 thousand litres of liquid pesticides was used for the prevention of pests and diseases.

2.11. Agricultural Implements and Machinery in Thoothukudi District

Table 2.20 Agricultural Implements and Machinery in Thoothukudi District (2014-15)

Sl.No.	Item	Numbers
1	Wooden Ploughs	5638
2	Iron Ploughs	2240
	Total	7878
3	Cart	4010
4	Gunnies	140
5	Sprayer (Manual)	2348
6	Sprayer (Power)	456
7	Water lifting devices (Manual)	48
8	Water lifting devices (Animal)	23
9	Diesel engine	1679
10	Electronic pumpset	7661
11	Drip irrigation	192
12	Sprinkler	6
13	Tractor	1153
14	Trailer	545
15	Sugarcane crusher	21

Source: Based on Quinquennial Livestock Census

The details of agricultural implements and machinery in the district during the year 2014-15 are furnished in Table 2.20. It could be seen from the table that there are about 5638 wooden ploughs, 2240 iron ploughs, 7661 electronic pump sets, 1153 tractors, 1679 diesel engines and 4010 carts are present in Thoothukudi district.

2.12. Agriculture Marketing and Regulated Market

The number of regulated markets and quantity and value of commodities transacted in the regulated markets are given in Table 2.21. There are 9 regulated markets in the district. The notified commodities are cotton, groundnut, maize, paddy, Chilies, coconut, sorghum, ragi, sunflower and castor. In the district, there are 108 milk societies, the farmers markets and 4 dairy farms. Besides there are two farmers markets functioning in the district. 4 dairy forms were located in this district. Farmers were sell their commodities like, vegetables, grains and their cattle in weekly market.

The details of Uzhavar sandhai and the commodities transacted during 2014-15 in Thoothukudi district are also given in Table 2.21.

Table 2.21 Quantity and Value of Commodities Transacted in 9 Regulated Markets of Thoothukudi District (2014-15)

Basic infrastructural facilities available in Marketing, Processing and Storage														
Sl. No.	**Particulars**	**Thoothukudi**	**Srivaikuntam**	**Karungulam**	**Thiruchendur**	**Sathankulam**	**Alwarthiruna geri**	**Udankudi**	**Kovilpatti**	**Kayathar**	**Ottapidaram**	**Pudur**	**Vilathikulam**	**Total**
No of Revenue Villages		**33**	**36**	**33**	**15**	**20**	**32**	**16**	**60**	**57**	**63**	**55**	**61**	**481**
1	Regulated Market	1	1	0	0	1	0	0	2 Kovilpatti, Ettaiya -puram	2 Kadampur, Kalugumalai	0	1	1	**9**
2	UzhavarSandhai	1	0	0	0	0	0	0	1	0	0	0	0	**2**
3	Milk Society	2	5	0	2	40	0	4	2	48	5	0	0	**108**
4	Daily Market	2	0	0	1	0	0	0	1	0	0	0	0	**4**
5	Weekly Market	0	1	1	1	1	1	1	1	1	1	0	0	**9**

Storage Facilities

Basic Infrastructural Facilities available in Marketing, Processing and Storage

Table 2.22 Existing Infrastructure Particulars in Thoothukudi District

Sl. No.	Particulars	Thoothukudi	Srivaikuntam	Karungulam	Thiruchendur	Sathankulam	Alwarthirunagari	Udankudi	Kovilpatti	Kayathar	Ottapidaram	Pudur	Vilathikulam	Total
1.	Storage Godown	8	9	19	0	2	2	0	2	2	4	3	12	**63**
2.	Drying Yard	10	14	40	15	41	66	17	7	32	43	11	19	**315**
3.	FCI Godown	2	0	0	0	0	0	0	0	0	0	0	0	**2**
4.	Civil Supply Godown	2	1	0	1	0	0	0	0	0	1	0	3	**8**
5.	Regulated Market-Godown	2	2	0	0	2	0	0	6	4	0	2	2	**20**
6.	Regulated Market-COLD STORAGE	1	0	0	0	0	0	0	2	1	0	0	1	**5**
7.	Agribusniness centre ABC	0	0	0	0	0	0	0	0	0	0	1	0	**1**
8.	Cold Storage Nila-6000 MT, Nianans-5000 MT	2	0	0	0	1 milk unit	0	0	0	0	0	0	0	**3**
9.	Seed Processing unit	0	0	1 Govt.	0	0	0	0	1	0	1	0	1	**4**
10.	Ripening Chamber	0	1 RM	0	0	0	0	0	0	0	0	0	0	**1**

Source: Deputy Director of Marketing, Thoothukudi

2.13 Sericulture

Apart from the agricultural activities, the district is also involved in the development of allied sectors in different blocks. Sericulture is a commercial sustainable farm based economic activity favouring the rural poor in the unorganized sector because of its low capital requirement and high returns. The area under mulberry and production of cocoon had increased considerably over the years. Most of the area under mulberry cultivation is concentrated in Srivaigundam, Kovilpatti and Sathankulam blocks. The details of sericulture development in Thoothukudi district are furnished in Table 2.23.

Table 2.23 Sericulture Development in Thoothukudi district

Sl. No.	Name of the Block	Area under Mulberry (ac)	Production of Cocoons	Value (Rs)
1.	Pudur	Nil	-	-
2.	Vilathikulam	8.00	2400	7.8
3.	Kayathar	13.00	3350	10.50
4.	Srivaigundam	35.00	9240	29.3
5.	Kovilpatti	32.10	9280	28.7
6.	Satthankulam	29.50	5810	19.0
	Total	**117.6**	**30080**	**95.3**

Source: District Statistical handbook 2014-15.

2.14. Animal Husbandry and Dairy Development

The Department of Animal Husbandry has contributed immensely in the development of animal husbandry in Thoothukudi and in providing additional income to the farmers in Thoothukudi district. Thoothukudi district is one of the rich districts in cattle wealth and poultry development. There are many milch breeds available in the district and the Tamil Nadu Milk Producers Federation has a milk collection centre and processing plant at Thoothukudi from where milk is transported to different parts of the State every day.

2.14.1. Livestock

Sector A. Population

The details regarding livestock population in Thoothukudi district are provided in Table 2.24. As per the 19th Livestock Census, the total livestock in the district was about 592790 numbers. The population of poultry in the district was about 512427. Poultry rearing has become a commercial activity in this District. The particulars on livestock population in the district are presented in table below.

Table 2.24 Livestock population in the district

Sl.No.	Particulars	Population
1	Cattle	110147
2	Buffaloes	7220
3	Sheep	178825
4	Goats	288684
5	Horses and ponies	18
6	Donkeys	856
7	Camels	1
8	Pigs	7039
	Total Livestock	**592790**
9	Elephants	1
10	Dogs	37687
11	Rabbits	464
	Poultry	
12	Back yard Poultry	347913
13	Farm Poultry	164514
	Total Poultry	**512427**

Source: 19th Livestock Population, 2012

2.14.2. Veterinary

The majority of the blocks in the district possess dispensaries, clinical centres and mobile units for the welfare of the livestock. In the case of hospitals, few are present in the blocks such as Srivaigundam and Kovilpatti. In all, 63 dispensaries are available in the district and the concentration of dispensaries are found in Thoothukudi, Karungulam, Alwarthirunagari, Kayathar and Ottappidaram blocks. In Tiruchendur and Alwarthirungari, blocks, Veterinary sub centres are unavailable. Mobile units are available only in Kovilpatti block. Likewise, animal diseases investigation units are not available in Thoothukudi district. The details of veterinary institutions are furnished in Table 2.25.

Table 2.25 Veterinary Institutions and Animals Treated

Sl. No.	Name of the block	Veterinary Institution			Other Units				Animals treated	Castration performed
		Poly clinic	Hospitals	Dispensaries	Clinics	Sub centres	Animal disease investigation unit	Mobile units		
1	Thoothukudi	-	-	6	1	4	-	-	41623	6091
2	Karungulam	-	-	6		1	-	-	39108	3474
3	Srivaikuntam	-	1	4		5	-	-	59599	4153
4	Sattankulam	-	-	5		3	-	-	52789	1716
5	Tiruchendur	-	-	5		-	-	-	34056	1611
6	Alwarthirunagari	-	-	6		-	-	-	43472	3747
7	Udangudi	-	-	4	-	2	-	-	36813	480
8	Kayatar	-	-	6		2	-	-	72010	10980
9	Kovilpatti	-	1	5	-	7	-	1	68500	17542
10	Ottapidaram	-	-	6	-	4	-	-	73000	54215
11	Vilathikulam	-	-	5	-	6	-	-	40200	3208
12	Pudur	-	-	5	-	4	-	-	48500	6547
	Total	**-**	**2**	**63**	**1**	**38**	**-**	**1**	**609670**	**113764**

Source: Regional Joint Director of Animal Husbandry, Thoothukudi.

2.14.3 Dairy Development (2014-15)

The infrastructure facilities in the district are furnished in the Table 2.26. The district possesses the cooperative marketing society, veterinary clinics and milk collection centre for effective functioning of the dairy department. The district recorded a reasonable number of veterinary clinics and cooperative marketing society. The district has considerable scope for creation of infrastructure facilities for dairy development.

Table 2.26 Infrastructure facilities for dairy development

Sl.No.	Name of the Block	No. of milk societies	Quantity of milk produced	Value of milk produced
1.	Thoothukudi	19	22500	562500
2.	Srivaikuntam	7	8928	223200
3.	Karungulam	36	49308	1232700
4.	Alwarthirunagari	18	14004	350100
5.	Tiruchendur	6	5196	129900
6.	Udangudi	3	828	20700
7.	Sathankulam	18	17520	438000
8.	Kovilpatti	33	108072	2701800
9.	Kayathar	49	160800	402000
10.	Vilathikulam	12	4980	105000
11.	Pudur	9	4200	105000
12.	Ottapidaram	29	37272	931800
	Total	**239**	**433608**	**7202700**

Source: Deputy Registrar (Dairying), Tirunelveli.

2.14.4. Poultry Development Centre

Poultry sector provides direct and indirect employment to the poor people of the district. In general, the State's relative share at the all India level was 19.7 per cent and Tamil Nadu stood first in poultry rearing. From the Table 2.27, Its evident that there are about 17 broilers were present in Thoothukudi district, among that seven were present in Karungulam, six were present in Thoothukudi and each two broilers were present in both Kovilpatti and Srivaikuntam.

Table 2.27 Block Wise Poultry Development Centre

Sl.No.	Name of the Block	Broiler (no.)
1.	Thoothukudi	6
2.	Kovilpatti	2
3.	Srivaikuntam	2
4.	Karungulam	7
	Total	**17**

Source: AD-Animal Husbandry

2.15. Fisheries Development

Inland fisheries, Marine fish catch are the fisheries for the fishermen in the district. Thoothukudi is the major reservoir in the district. More varieties of fish are found in Thoothukudi reservoir. The total length of costal line is 163.5 km. In Thoothukudi

district about eight coastal blocks and 24 coastal centres are available in the district. During 2014-15, the marine and inland fish catch production are 47640 tonnes and 105.60 tonnes respectively.

The details of fish production are furnished in Table 2.28.

Table 2.28 Fisheries Development and Production

Year 2014- 15

Name and Address of Fishing Centres	Inland Fish Catch (tonnes)	Marine Fish Catch (tonnes)	Fisherman Engaged (no.)
(1)	(2)	(3)	(4)
Thoothukudi district	105.60	47640	**18464**

Source: Assistant Director of Fisheries, Thoothukudi.

2.16 Banking and Insurance

The banking and insurance facilities in the district are furnished in the Table 2.29.Its evident that there are about 244 banks are present in Thoothukudi district, in that 202 banks are public sector banks and 42 banks are private sector banks. There are about 19458 crores of deposits are in both public and private sector banks of Thoothukudi district.

Table 2.29 Number of Commercial Banks

Year: 2014-15

Items	No.of Bank	Deposits (₹ in crores)	Advance (₹ in crores)	Credit deposit Ratio	Sector wise credit details (₹ in 000s)		
					Priority	SSI	Agriculture
Public sector banks	202	17510	13015	74	42360754	12551510	1789443
Private Sector Banks	42	1948	2527	130	21388415	5533592	382702
Total	**244**	**19458**	**15542**		**63749169**	**18085102**	**2172145**

Source: Lead DistrictManager (SBI) Thoothukudi (District Statistical Hand Book 2015).

2.17. Insurance Scheme

Details of Insurance schemes of Thoothukudi district were presented in Table 2.30.

Table 2.30 No.of Insurance Schemes

Year: 2014- 2015

Sl. No.	Name of the Insurance	No. of Branches	Policies Issued	Sum Assured	No. of Beneficiaries	Amount paid as compen-sation
1	L.I.C.	unit 1	113855	2010.00 Cr	138857	445.38cr
2	P.L.I.	1	634	20.32	534	
3	Oriental Insurance Co, Ltd. Thoothukudi(2013-2014	2	24920	9.8	720	6.12
4	RPLI	1	2404	22.78	2404	
5	National Insurance Company	-	-	-	-	-

Source: Concerned Insurance Institutions.& Superintendent of Post office, Kovilpatti and Thoothukudi.

Table 2.31 Cooperative Societies in Thoothukudi District

Year: 2014-2015

Sl.No.	Type of Societies	No.of Societies	Membership	Share Capital	Working Capital	Loans Advanced	Loan out standing	Loans Overdue	No. of Employees
1.	District Central Co-op. Bank	1	579	1406.08	50359.54	58115.67	45936.20	3422.42	108
2.	District Co-op. Union	1	806	0	0	0	0	0	0
3.	Dist. Co-op Wholesale Stores	1	2185	39.49	181.29	120.00	104.13	0	64
4.	District Co-op Printing Press	1	307	11.59	23.24	10.00	10.00	2.00	13
5.	Primary AgriculturalCcredit Society	152	267486	1555.02	54058.47	47634.39	49994.94	2705.50	835
6.	Primary Co -op Agrl. And Rural Development Bank	3	15503	78.59	1942.37	1315.61	1177.38	357.77	8
7.	Co- op Urban Bank	8	115077	1119.85	42124.43	51052.58	28585.66	15638.68	126
8.	Employees Co-op Thrift and Credit Society	53	17111	2382.27	15299.09	10708.89	14460.05	292.24	69
9.	Co - op Marketing Society	3	25865	22.29	574.20	800.27	504.04	16.07	110
10.	Primary Co-operative Store	26	25737	21.09	310.86	0	0	0	130
11.	Student Co-op Stores	6	3442	0.91	17.14	0	0	0	0
12.	Labour Contract Co-op Societies	0	0	0	0	0	0	0	0

Table 2.31 Cooperative Societies in Thoothukudi District (Contd.,)

Sl.No.	Type of Societies	No.of Societies	Membership	Share Capital	Working Capital	Loans Advanced	Loan out standing	Loans Overdue	No. of Employees
13.	Salt Producers Co-op Society	3	1080	3.11	16	0	0	0	10
14.	Co-op Land Colonization Society	1	52	0.1	0.17	0	0.11	0.11	0
15.	Co-op Canteen	1	785	0.26	45.26	0	0	0	3
16.	Urban Co-operative Credit Society	3	4236	21.87	200.14	218.00	174.34	17.99	3

Source: Joint Registrar Co-op. Societies, Thoothukudi

CHAPTER III

DEVELOPMENT OF AGRICULTURE AND ALLIED SECTOR

The action plan for enhancing the agricultural production includes the following components:

3.1. Trends in Area, Production and Productivity of Major Crops

Development of agricultural sectors calls for analyzing the current situation of area, production and productivity of crops and projecting the same over years keeping the existing trend as base.

Table 3.1 Area Production and Yield of Major crops in Thoothukudi district

(Triennium average ending 2014-2015)

Sl.No	Crop	Area	%	Production	Yield (kg/ha)
1	Paddy	11415	6.91	54646	4601
2	Blackgram	14275	8.64	29733	1800
3	Greengram	12617	7.64	21820	1714
4	Maize	78	0.05	303	3611
5	Cumbu	27467	16.62	62886	2753
6	Banana	29267	17.71	13476	433
7	Chillies	34797	21.06	18789	463
8	Cholam	11083	6.71	3632	319
9	Coconut	253	0.15	25404	103
10	Cotton	9362	5.67	390375	41726
11	Sunflower	772	0.47	N.A	N.A
12	Gingelly	1299	0.79	6398	4833
13	Ragi	5213	3.15	15663	427
14	Groundnut	617	0.37	1795	2883
15	Onion	799	0.48	170	213
16	sugarcane	5920	3.58	N.A	N.A
17	Sunflower	N.A	N.A	1592	621
	Total	**165234**	**100.00**		

N.A denotes Not Available

Source: Season and Crop Report (2005-2006 to 2014-15), Department of Economics and Statistics, Government of Tamil Nadu.

Table 3.1.1. Compound Growth Rates (CGR) of Area, Production and Productivity Under Major crop in Thoothukudi District

Sl.No.	Crops	CGR during 2005-2006 to 2014-2015 (%)		
		Area	Production	Yield
1	Paddy	-7.03	-5.37	1.79
2	Cholam	7.64	18.30	9.91
3	Cumbu	-6.33	-3.74	-0.21
4	RAGI	-17.65	-10.56	8.68
5	Maize	18.46	19.98	1.29
6	Blackgram	1.98	-2.05	-3.96
7	Greengram	4.42	2.24	-2.08
8	Chillies	-3.75	-10.42	-6.94
9	Sugarcane	-16.80	0.18	-0.80
10	Banana	-1.01	-6.45	-5.49
11	Mango	2.66	N.A	N.A
12	Onion	-0.39	-1.12	-3.42
13	Cotton	-0.18	11.83	12.05
14	Groundnut	-11.89	-6.10	10.02
15	Gingelly	-14.45	-22.33	-8.04
16	Coconut	2.58	N.A	N.A
17	sunflower	N.A	13.12	3.26

N.A denotes Not Available

The Table 3.1 indicates that maize and banana have increased.in area, production and productivity. Black gram, green gram, chillies, coconut, onion and sugarcane gained increase in area and production and loss in productivity. Paddy area was increased with decrease in production and productivity. Cumbu, sunflower, gingeely, groundnut and cotton gained in productivity but lost area and production. Sorghum and ragi lost area with decrease in productivity and production.

Table 3.1.2 Cropping Pattern Changes in Thoothukudi District 2014 -15

Sl.No.	Crops	Area(ha)	Percentage to the Total Area
1	Paddy	17678	7
2	Cholam	8231	3
3	Cumbu	7982	3
4	Maize	18763	8
5	Black gram	33447	14
6	Green gram	31881	13
7	Coconut	5717	2
8	Gingelly	1068	0.45
9	Cotton	3610	2
10	Banana	9586	4
11	Chilies	14120	6
	Total	**152083**	**64**

Details of cropping pattern changes in Thoothukudi district is furnished in the Table 3.1.2. It showes that 14 per cent of area was occupied by black gram followed by green gram occupies about 13 per cent. Gingelly occupied only 0.45 percent which is less than one per cent.

3.2. Projection on Area, Production and Yield by 2023

Table 3.2 Projected Area, Yield and Production (2023)

Sl. No.	Crops	Area in Ha	Production in tonne	Productivity t/ha
1	Paddy	20933	92420	4.415
2	Blackgram	55275	13599	0.246
3	Greengram	81933	18965	0.231
4	Maize	23320	183216	7.857
5	Cumbu	9547	17826	1.867
6	Banana	9819	542426	55.241
7	Chilies	11599	2906	0.250
8	Cholam	8027	8513	1.061
9	Coconut	6920	717	0.104
10	Cotton	1469	3487	2374
11	Sunflower	1085	541	0.499
12	Gingelly	1650	606	0.367

Source: Season and Crop Report (1986-87 to 2014-15), Department of Economics and Statistics, Government of Tamil Nadu.

Agricultural production can be substantially increased if the yield gap is achieved through technical interventions and policy adoption. The Tamil Nadu Vision 2023 has envisaged strategies for improving productivity and thereby sustaining growth in agriculture production so as to meet the growing demand for the agricultural produce and creating food security.

Information on the ruling varieties, their average and potential yield and progressive farmers' yield were gathered from the Office of the Joint Director of Agriculture and the details are furnished (Table 3.3).

Table 3.3 Yield Gap of the Identified Potential Crops in Thoothukudi District

(kg / ha)

Sl. No.	Crop	Variety	Potential yield (A)	Progressive Farmer Maximum Yield (B)	Average Yield (C)	Yield Gap I (A-B)	Yield Gap I (%)	Yield Gap II (B-C)	Yield Gap II (%)	Over all Yield Gap (A-C)	Over all Yield Gap (%)
1	Paddy (Irrigated)	ASD 16*	5600	4750	4473	850	15.18	277	5.83	1127	20.13
		ADT 43*	5900	5550	5059	350	5.93	491	8.85	841	14.25
		BPT5204	5242	3405	3315	1837	35.04	90	2.64	1927	36.76
		ADT 36	4000	3750	3400	250	6.25	350	9.33	600	15.00
2	Blackgram (Rainfed)	VBN 3	775	380	254	395	50.97	126	33.16	521	67.23
		VBN 4	780	500	272	280	35.90	228	45.60	508	65.13
3	Greengram (Rainfed)	VBN 2	750	530	324	220	29.33	206	38.87	426	56.80
		CO 6	900	766	309	134	14.89	457	59.66	591	65.67
		CO 7	978	759	382	219	22.39	377	49.67	596	60.94
4	Maize (Rainfed)	NK6240	8000	5760	3912	2240	28.00	1848	32.08	4088	51.10
5	Cumbu (Rainfed)	Pioneer 86 M 33	3600	2934	1394	666	18.50	1540	52.49	2206	61.28
6	Cholam (Rainfed)	PAC 501	7600	4345	3544	3255	42.83	801	18.43	4056	53.37
		K Tall	3750	3000	2400	750	20.00	600	20.00	1350	36.00
7	Banana (Irrigated)	Poovan	50000	42500	30000	7500	15.00	11500	27.06	20000	40.00
		Local	45000	36000	23000	9000	20.00	11000	30.56	22000	48.89
8	Chilies (Rainfed)	Local**	2679	1480	1120	1199	44.76	360	24.32	1559	58.19
		K 1	3000	2500	1700	500	16.67	800	32.00	1300	43.33

Table 3.3 Yield Gap of the Identified Potential Crops in Thoothukudi District (Contd.,)

Sl. No.	Crop	Variety	Potential yield (A)	Progressive Farmer Maximum Yield (B)	Average Yield (C)	Yield Gap I (A-B)	Yield Gap I (%)	Yield Gap II (B-C)	Yield Gap II (%)	Over all Yield Gap (A-C)	Over all Yield Gap (%)
9	Coconut (Irrigated) In Nos.	East coast tall ***	18000	17210	13127	790	4.39	4083	23.72	4873	27.07
10	Sunflower (Rainfed)	Gangakaveri	2400	1910	1621	490	20.42	289	15.13	779	32.46
		Co 4	1500	970	524	530	35.33	446	45.98	976	65.07
11	Gingelly (Rainfed)	TMV 3	400-650	420	181	230	35.38	239	56.9	469	72.15
12	Cotton (Rainfed)	SVPR 2	2000	640	381	1360	68	259	40.47	1619	80.95
		MCU 5	1850	850	368	1000	54.05	482	56.71	1482	80.11
		RCH2 BT	3200	1981	1068	1219	38.09	913	46.09	2132	66.63

Source: Crop Production Guide, Crop Cutting experiments yield of Thoothukudi district and Adoptive research trail (*) of Thoothukudi district and On farm testing experiments of RRS, Paramakudi (**) OFT experiments of KVK Ramnathapuram(***)

The major ruling rice varieties of the district were ASD 16, ADT 36, ADT 43 and BPT 5204 and the overall yield gap varied from 600 kg/ ha in ADT 36 to 1927 kg/ ha in BPT 5207. NK 6240 and Pioneer 86 M 33 are the ruling rainfed maize and cumbu varieties and the overall yield gap was 4088 and 2206 kg/ ha, respectively. PAC 501 and K Tall are the common varieties of cholam in the district and the yield gap of these two varieties were found to be 4056 and 1350 kg/ ha, respectively.

With regard to rainfed pulses, VBN 3 and VBN 4 are the main ruling varieties and the yield gaps identified were 521 and 508 kg/ ha, respectively. The ruling varieties of greengram were VBN 2, CO 6 and CO 7 and the overall yield gap ranged between 426 kg/ ha in VBN 2 , 591 kg/ ha in CO 6 and 596 kg/ ha in CO 7.

The poovan and local banana varieties were grown in the district under irrigated condition and the overall yield gap was 20000 kg/ ha for poovan and 22000 kg/ ha for local varieties. Similarly, K1 and local chilies were cultivated in the district and the yield gap were 1300 and 1559 kg/ha, respectively. The overall yield gap found in coconut (East coast tall) was 4873 Nos. The prime ruling varieties of sunflower are Gangakaveri and CO 4 and the yield gap of these varieties were found to be 779 and 976 kg/ ha, respectively.

The SVPR 2, MCU 5 and RCH2 BT are the prime ruling varieties/ hybrid of the district and the overall yield gap varied from 1482 kg/ ha in MCU 5 to 2132 kg/ ha in RCH2 BT. This calls for location specific cost effective technological adoption and appropriate interventions.

Projected Yield and Production of Selected Crops

The major crops grown in Thoothukudi district *viz.*, paddy, maize, cholam, cumbu, blackgram, greengram, banana, chilies, coconut, sunflower and cotton have been chosen for projecting their area, production and yield upto 2022-23.

Table 3.4 Existing and Projected Yield and Production of Paddy in Thoothukudi District

Variety	Yield GAP I	Yield GAP II	Overall Yield Gap
ASD 16	850	277	1127
ADT 43	350	491	841
BPT 5204	1837	90	1927
ADT 36	250	350	600

Table 3.4 Existing and Projected Yield and Production of Paddy in Thoothukudi District (Contd.,)

Ruling Varieties	ASD 16	ADT 43	BPT5204	ADT36
Potential Yield	5600	5900	5242	4000
Progressive Farmer Yield	4750	5500	3405	3750
Average Yield	4473	5059	3315	3400
Overall Yield Gap	1127	841	1927	600
Required Growth Rate	25.20	16.62	58.13	17.65
Annual Growth Rate	2.10	1.39	4.84	1.47

Sl.No.	Year	ASD 16	ADT43	BPT 5204	ADT36
1	2010-11	4473	5059	3315	3400
2	2011-12	4567	5129	3475	3450
3	2012-13	4663	5201	3644	3501
4	2013-14	4761	5273	3820	3552
5	2014-15	4861	5346	4005	3604
6	2015-16	4963	5421	4199	3657
7	2016-17	5067	5496	4402	3711
8	2017-18	5173	5572	4615	3766
9	2018-19	5282	5650	4838	3821
10	2019-20	5393	5728	5073	3877
11	2020-21	5506	5808	5318	3934
12	2021-22	5622	5889	5575	3992
13	2022-23	5740	5970	5845	4051

Source: Joint Director of Agriculture office, Thoothukudi

Table 3.4.1 Projected Increase in Yield and Production of Paddy (2014-15 to 2022-23)

Details	Quantity	Units
Area under Paddy	20007	ha
Production	89442	tonnes
Yield	4.47	tonnes
Doubling the production	**178884**	tonnes
Yield	8.94	tonnes

Source: Joint Director of Agriculture office, Thoothukudi

Sl.No.	Details	ASD 16	ADT43	BPT 5204	ADT36	Total
1	Proportion of Varieties	0.35	0.2	0.2	0.25	1
2	Area	7002	4001	4001	5002	20007
3	2011-12	31980	20524	13907	17256	83666.77
4	2012-13	32651	20810	14580	17510	85550.38
5	2013-14	33337	21099	15285	17767	87488.36
6	2014-15	34037	21392	16025	18028	89482.7
7	2015-16	34752	21690	16801	18293	91535.46
8	2016-17	35482	21991	17614	18562	93648.81
9	2017-18	36227	22297	18466	18835	95824.98
10	2018-19	36987	22607	19360	19112	98066.32
11	2019-20	37764	22921	20297	19393	100375.3
12	2020-21	38557	23240	21280	19678	102754.4
13	2021-22	39367	23563	22310	19967	105206
14	2022-23	40194	23890	23389	20261	107734

The major paddy growing seasons of the district are *Early Kar* and *Kar* and the varieties cultivated were ADT 36, ADT 43, ASD 16 and BPT 5204. Extension machinery needs to be strengthened to bridge the yield gap such that the yield is raised annually at the rate of 3.14 per cent. The bridging up of the yield gap would result in the gradual increase in paddy production from 83,666 tonnes/ ha in 2011-12 to 1,07,734 tonnes/ ha in 2022-23 (Table 3.4 and 3.4.1).

Table 3.5 Existing and Projected Yield and Production of Maize in Thoothukudi District

Variety	Yield GAP I	Yield GAP II	Overall yield gap
NK6240	2240	1848	4088

Ruling Varieties	NK6240
Potential Yield	8000
Progressive Farmer Yield	5760
Average Yield	3912
Overall Yield Gap	4088
Required Growth Rate	104.50
Annual Growth Rate	8.71

Sl.No.	Year	NK6240
1	2010-11	3912
2	2011-12	4253
3	2012-13	4623
4	2013-14	5026

Sl.No.	Year	NK6240
5	2014-15	5464
6	2015-16	5939
7	2016-17	6457
8	2017-18	7019
9	2018-19	7631
10	2019-20	8295
11	2020-21	9018
12	2021-22	9803
13	2022-23	10657

Source: Joint Director of Agriculture office, Thoothukudi

Table 3.5.1 Projected Increase in Yield and Production of Maize (2011-12 to 2022-23)

Particulars	Quantity	Units
Area under Maize	17495	ha
Production	61816	tonnes
Yield	3.53	tonnes
Doubling the production	123632	tonnes
Yield	7.07	tonnes

Sl. No.	Particulars	NK 6240	Total
1	Proportion of Varieties	1	1
2	Area	17495	17495
3	2011-12	74402	74402
4	2012-13	*80882*	*80882*
5	2013-14	87927	87927
6	2014-15	95585	95585
7	2015-16	103911	103911
8	2016-17	112961	112961
9	2017-18	122800	122800
10	2018-19	133496	133496
11	2019-20	145124	145124
12	2020-21	157764	157764
13	2021-22	171505	171505
14	2022-23	186443	186443

Source: Joint Director of Agriculture office, Thoothukudi

Maize is a millet crop grown in the district and NK 6240 is the commonly grown variety. The overall yield gap of 4088 kg/ ha was estimated. These yield gaps could be bridged over a period from 2011-12 to 2022-23 by increasing the yield annually at the rate of 8.71 per cent. This would in turn increase the maize production from 74402 tonnes/ ha in 2011-12 to 1,86,443 tonnes/ ha in 2022-23 (Table 3.5 and 3.5.1).

Table 3.6 Existing and Projected Yield and Production of Cholam in ThoothukudiDistrict

Variety	Yield GAP I	Yield GAP II	Overall Yield Gap
PAC 501	3255	801	4056
K Tall	750	600	1350

Ruling Varieties	PAC 501	K Tall
Potential Yield	7600	3750
Progressive Farmer Yield	4345	3000
Average Yield	3544	2400
Overall Yield Gap	4056	1350
Required Growth Rate	114.45	56.25
Annual Growth Rate	9.54	4.69

Sl.No.	Year	PAC 501	K Tall
1	2010-11	3544	2400
2	2011-12	3882	2513
3	2012-13	4252	2630
4	2013-14	4658	2754
5	2014-15	5103	2883
6	2015-16	5589	3018
7	2016-17	6123	3160
8	2017-18	6707	3308
9	2018-19	7346	3463
10	2019-20	8047	3625
11	2020-21	8815	3795
12	2021-22	9656	3973
13.	2022-23	10577	4160

Source: Joint Director of Agriculture office, Thoothukudi

Table 3.6.1 Projected Increase in Yield and Production of Cholam (2011-12 to 2022-23)

Particulars	Quantity	Units
Area under Cholam	8958	ha
Production	18871	tonnes
Yield	2.11	tonnes
Doubling the production	37742	tonnes
Yield	4.21	tonnes

Sl.No.	Year	PAC 501	K Tall	Total
1	Proportion of Varieties	0.8	0.2	1
2	Area	7166	1792	8958
3	2011-12	27821	4502	32322
4	2012-13	30475	4713	35187
5	2013-14	33382	4934	38316
6	2014-15	36567	5165	41732
7	2015-16	40055	5407	45462
8	2016-17	43876	5661	49537
9	2017-18	48062	5926	53989
10	2018-19	52647	6204	58852
11	2019-20	57670	6495	64165
12	2020-21	63172	6800	69972
13	2021-22	69198	7119	76317
14	2022-23	75800	7453	83252

Source: Joint Director of Agriculture office, Thoothukudi

Cholam is cultivated in an area of 8958 ha with a yield of 32,322 tonnes/ ha (2011-12) and projected yield increase of 83,252 tonnes/ ha (2022-23) (Table 3.6 and 3.6.1).

Table 3.7 Existing and Projected Yield and Production of Cumbu in Thoothukudi District

Variety	Yield GAP I	Yield GAP II	Overall YG
Pioneer 86 M 33	666	1540	2206
ICMV 221	490	350	840

Ruling Varieties	Pioneer 86 M 33	ICMV221
Potential Yield	3600	2260
Progressive Farmer Yield	2934	1770
Average Yield	1394	1420
Overall Yield Gap	2206	840
Required Growth Rate	158.25	59.15
Annual Growth Rate	13.19	4.93

Sl.No.	Year	Pioneer 86M33	ICMV221
1	2010-11	1394	1420
2	2011-12	1578	1490
3	2012-13	1786	1563
4	2013-14	2022	1641
5	2014-15	2288	1721
6	2015-16	2590	1806

Sl.No.	Year	Pioneer 86M33	ICMV221
7	2016-17	2932	1895
8	2017-18	3318	1989
9	2018-19	3756	2087
10	2019-20	4251	2190
11	2020-21	4812	2298
12	2021-22	5447	2411
13	2022-23	6165	2530

Source: Joint Director of Agriculture office, Thoothukudi

Table 3.7.1 Projected Increase in Yield and Production of Cumbu (2011-12 to 2022-23)

Particulars	Quantity	Units
Area under Cumbu	9390	ha
Production	16473	tonnes
Yield	1.75	tonnes
Doubling the Production	32946	tonnes
Yield	3.51	tonnes

Sl.No.	Details	Pioneer 86 M33	ICMV 221	Total
1	Proportion of Varieties	0.8	0.2	1
2	Area	7512	1878	9390
3	2011-12	11853	2798	14651
4	2012-13	13416	2936	16353
5	2013-14	15186	3081	18267
6	2014-15	17189	3233	20422
7	2015-16	19456	3392	22848
8	2016-17	22023	3559	25582
9	2017-18	24927	3735	28662
10	2018-19	28215	3919	32134
11	2019-20	31937	4112	36049
12	2020-21	36149	4315	40464
13	2021-22	40917	4528	45445
14	2022-23	46314	4751	51065

Source: Joint Director of Agriculture office, Thoothukudi

Cumbu is a millet crop grown in the district and the overall yield gap estimated was 2206 tonnes / ha (Pioneer 86 M33). These yield gaps could be bridged over a period from 2011-12 to 2022-23 by increasing the yield annually at the rate of 3.51 per cent. This would in turn increase the cumbu production from 11853 tonnes / ha in 2011-12 to 46,314 tonnes / ha in 2022-23 (Table 3.7 and 3.7.1).

Table 3.8 Existing and Projected Yield and Production of Blackgram in ThoothukudiDistrict

Variety	Yield GAP I	Yield GAP II	Over all Yield gap
VBN 3	395	238	633
VBN 4	280	228	508

Ruling Varieties	VBN 3	VBN 4
Potential Yield	775	780
Progressive Farmer Yield	380	500
Average Yield	254	272
Overall Yield Gap	521	508
Required Growth Rate	205.12	186.76
Annual Growth Rate	17.09	15.56

Sl.No.	Year	VBN 3	VBN 4
1	2010-11	254	272
2	2011-12	297	314
3	2012-13	348	363
4	2013-14	408	420
5	2014-15	477	485
6	2015-16	559	561
7	2016-17	655	648
8	2017-18	766	749
9	2018-19	897	865
10	2019-20	1051	1000
11	2020-21	1230	1155
12	2021-22	1441	1335
13	2022-23	1687	1543

Source: Joint Director of Agriculture office, Thoothukudi

Table 3.8.1 Projected Increase in Yield and Production of Blackgram (2011-12 to 2022-23)

Details	Quantity	Units
Area under Blackgram	37923	ha
Production	6540	tonnes
Yield	0.17	tonnes
Doubling the production	**13080**	tonnes
Yield	0.34	tonnes

Sl.No.	Year	VBN 3	VBN 4	Total
1	Proportion of Varieties	0.5	0.5	1
2	Area	18962	18962	37923
3	2011-12	5639	5960	11599
4	2012-13	6603	6887	13490
5	2013-14	7732	7959	15691
6	2014-15	9053	9198	18250
7	2015-16	10600	10629	21229
8	2016-17	12412	12283	24694
9	2017-18	14533	14194	28726
10	2018-19	17016	16402	33418
11	2019-20	19924	18954	38879
12	2020-21	23329	21904	45233
13	2021-22	27316	25312	52628
14	2022-23	31985	29250	61235

Source: Joint Director of Agriculture office, Thoothukudi

Blackgram is an important pulse crop grown in an area of 37923 ha. VBN 3 and VBN 4 are the ruling varieties with a yield gap of 633 and 508 tonnes / ha, respectively. The bridging up of the yield gap would result in the gradual increase in blackgram production from 11,599 tonnes / ha in 2011-12 to 61,235 tonnes / ha in 2022-23 (Table 3.8 and 3.8.1).

Table 3.9 Existing and Projected Yield and Production of Greengram in ThoothukudiDistrict

Variety	Yield GAP I	Yield GAP II	Overall Yield Gap
VBN 2	220	372	426
CO 6	134	457	591
CO7	219	377	596

Ruling Varieties	VBN 2	CO 6	CO 7
Potential Yield	750	900	978
Progressive Farmer Yield	530	766	759
Average Yield	324	309	382
Overall Yield Gap	426	591	596
Required Growth Rate	131.48	191.26	156.02
Annual Growth Rate	10.96	15.94	13.00

Sl.No.	Year	VBN 2	CO 6	CO 7
1	2010-11	324	309	382
2	2011-12	360	358	432
3	2012-13	399	415	488
4	2013-14	443	482	551
5	2014-15	491	558	623
6	2015-16	545	647	704
7	2016-17	605	751	795
8	2017-18	671	870	899
9	2018-19	745	1009	1016
10	2019-20	826	1170	1148
11	2020-21	917	1356	1297
12	2021-22	1017	1572	1465
13	2022-23	1129	1823	1656

Source: Joint Director of Agriculture office, Thoothukudi

Table 3.9.1 Projected Increase in Yield and Production of Greengram

(2011-12 to 2022-23)

Details	Quantity	Units
Area under Greengram	35410	ha
Production	6269	tonnes
Yield	0.18	tonnes
Doubling the Production	12538	tonnes
Yield	0.35	tonnes

Sl.No.	Particulars	VBN 2	CO 6	CO 7	Total
1	Proportion of Varieties	0.5	0.3	0.2	1
2	Area	17705	10623	7082	35410
3	2011-12	6365	3806	3057	13228
4	2012-13	7063	4412	3454	14930
5	2013-14	7837	5116	3904	16856
6	2014-15	8696	5931	4411	19038
7	2015-16	9649	6877	4984	21510
8	2016-17	10706	7973	5632	24311
9	2017-18	11880	9244	6365	27488
10	2018-19	13182	10717	7192	31091
11	2019-20	14626	12425	8127	35179
12	2020-21	16230	14406	9183	39819
13	2021-22	18008	16702	10377	45088
14	2022-23	19982	19364	11726	51073

Source: Joint Director of Agriculture office, Thoothukudi

Greengram is another major pulse crop grown in an area of 35410 ha in the district. The bridging up of the yield gap would result in the gradual increase in greengram production from 13,288 t / ha in 2011-12 to 51,073 t/ ha in 2022-23 (Table 3.9 and 3.9.1).

Table 3.10 Existing and Projected Yield and Production of Cotton in Thoothukudi District

Variety	Yield GAP I	Yield GAP II	Overall YG
SVPR 2	1360	259	1619
MCU 5	1000	482	1482
RCH2 BT	1219	913	2132

Ruling Varieties	SVPR 2	MCU 5	RCH2BT
Potential Yield	2000	1850	3200
Progressive Farmer Yield	640	850	1981
Average Yield	381	368	1068
Overall Yield Gap	1619	1482	2132
Required Growth Rate	424.93	402.72	199.63
Annual Growth Rate	35.41	33.56	16.64

Sl.No.	Year	SVPR 2	MCU 5	RCH2BT
1	2010-11	381	368	1068
2	2011-12	516	492	1246
3	2012-13	699	656	1453
4	2013-14	946	877	1695
5	2014-15	1281	1171	1977
6	2015-16	1735	1564	2306
7	2016-17	2349	2089	2689
8	2017-18	3180	2790	3137
9	2018-19	4307	3726	3659
10	2019-20	5832	4977	4268
11	2020-21	7896	6647	4978
12	2021-22	10693	8877	5806
13	2022-23	14479	11857	6772

Source: Joint Director of Agriculture office, Thoothukudi

Table 3.10.1 Projected Increase in Yield and Production of Cotton (2011-12 to 2022-23)

Particulars	Quantity	Units
Area under Cotton	3230	ha
Production	10847	tonnes
Yield	3.36	tonnes
Doubling the production	21694	tonnes
Yield	6.72	tonnes

Sl.No.	Particulars	SVPR 2	MCU 5	RCH2BT	Total
1	Proportion of Varieties	0.2	0.15	0.65	1
2	Area	646	485	2100	3230
3	2011-12	333	238	2615	3187
4	2012-13	451	318	3051	3820
5	2013-14	611	425	3558	4594
6	2014-15	827	567	4150	5545
7	2015-16	1120	758	4841	6719
8	2016-17	1517	1012	5646	8176
9	2017-18	2055	1352	6586	9992
10	2018-19	2782	1805	7682	12269
11	2019-20	3767	2411	8960	15138
12	2020-21	5101	3220	10451	18773
13	2021-22	6907	4301	12190	23399
14	2022-23	9353	5745	14219	29317

Source: Joint Director of Agriculture office, Thoothukudi

In Thoothukudi district, cotton is cultivated in an area of 3230 ha. Major varieties/ hybrids of cotton grown in the district are SVPR 2, MCU 5 and RCH2BT. The yield gap estimated was 5233 t/ha and the annual growth rate estimated was 35.41, 33.56 and 16.64 per cent for SVPR 2, MCU 5 and RCH2BT, respectively. The increase in production by bridging this yield gap from 3187 t/ha (2010-11) to 29,317 t/ha (2022-23) (Table 3.10 and 3.10.1).

Table 3.11 Existing and Projected Yield and Production of Gingelly in ThoothukudiDistrict

Variety	Yield GAP I	Yield GAP II	Overall YG
TMV 3	230	239	469

Ruling Varieties	TMV 3
Potential Yield	650
Progressive Farmer Yield	420
Average Yield	181
Overall Yield Gap	469
Required Growth Rate	259.12
Annual Growth Rate	21.59

Sl.No.	Year	TMV 3
1	2010-11	181
2	2011-12	220
3	2012-13	268
4	2013-14	325
5	2014-15	396
6	2015-16	481
7	2016-17	585
8	2017-18	711
9	2018-19	865
10	2019-20	1051
11	2020-21	1278
12	2021-22	1554
13	2022-23	1890

Source: Joint Director of Agriculture office, Thoothukudi

Table 3.11.1 Projected Increase in Yield and Production of Gingelly (2011-12 to 2022-23)

Particulars	Quantity	Units
Area under Gingelly	1120	ha
Production	307	tonnes
Yield	0.27	tonnes
Doubling the production	614	tonnes
Yield	0.55	tonnes

Sl.No.	Particulars	TMV 3	Total
1	Proportion of Varieties	1	1
2	Area	1120	1120
3	2011-12	246	246
4	2012-13	300	300
5	2013-14	364	364
6	2014-15	443	443
7	2015-16	539	539
8	2016-17	655	655
9	2017-18	796	796
10	2018-19	968	968
11	2019-20	1178	1178
12	2020-21	1432	1432
13	2021-22	1741	1741
14	2022-23	2117	2117

Source: Joint Director of Agriculture office, Thoothukudi

Gingelly is an oilseed crop grown in Thoothukudi district under rainfed conditions. Major variety grown in the district is TMV 3 and it has a yield potential of 650 tonnes/ ha. By bridging the yield gap, the production could be increased from 246 t/ha (2011-12) to 2117 t/ha (2022-23) (Table 3.11and 3.11.1).

Table 3.12 Existing and Projected Yield and Production of sunflower in ThoothukudiDistrict

Variety	Yield GAP I	Yield GAP II	Overall YG
Gangakaveri	490	289	779
CO 4	530	446	976

Ruling Varieties	Gangakaveri	CO 4
Potential Yield	2400	1500
Progressive Farmer Yield	1910	970
Average Yield	1621	524
Overall Yield Gap	779	976
Required Growth Rate	48.06	186.26
Annual Growth Rate	4.00	15.52

Sl.No.	Year	Gangakaveri	CO 4
1	2010-11	1621	524
2	2011-12	1686	605
3	2012-13	1753	699
4	2013-14	1823	808
5	2014-15	1896	933
6	2015-16	1972	1078
7	2016-17	2051	1245
8	2017-18	2133	1439
9	2018-19	2218	1662
10	2019-20	2307	1920
11	2020-21	2399	2218
12	2021-22	2495	2562
13	2022-23	2595	2959

Source: Joint Director of Agriculture office, Thoothukudi

Table 3.12.1 Projected Increase in Yield and Production of Sunflower (2011-12 to 2022-23)

Details	Quantity	Units
Area under Sunflower	1254	ha
Production	614	tonnes
Yield	0.49	tonnes
Doubling the Production	1228	tonnes
Yield	0.98	tonnes

Sl.No.	Particulars	Gangakaveri	CO4	Total
1	Proportion of Varieties	0.9	0.1	1
2	Area	1129	125	1254
3	2011-12	1903	76	1979
4	2012-13	1979	88	2066
5	2013-14	2058	101	2159
6	2014-15	2140	117	2257
7	2015-16	2226	135	2361
8	2016-17	2315	156	2471
9	2017-18	2407	180	2588
10	2018-19	2504	208	2712
11	2019-20	2604	241	2845
12	2020-21	2708	278	2986
13	2021-22	2816	321	3138
14	2022-23	2929	371	3300

Source: Joint Director of Agriculture office, Thoothukudi

In Thoothukudi district, sunflower is grown in an area of 1254 ha. Major varieties grown in the district are Gangakaveri and CO 4. The yield gap estimated was 779 and 976 tonnes/ ha in Gangakaveri and CO 4, respectively. The annual growth rate required to raise the yield from 1979 t/ha in 2011-12 to 3300 t/ha in 2022-23 and estimated as 4.00 and 15.52 per cent, respectively (Table 3.12 and 3.12.1).

Table 3.13 Existing and Projected Yield and Production of Coconut in ThoothukudiDistrict

Variety	Yield GAP I	Yield GAP II	Overall YG
East Coast Tall	790	4083	4873

Ruling Varieties	East Coast Tall
Potential Yield	18000
Progressive Farmer Yield	17210
Average Yield	13127
Overall Yield Gap	4873
Required Growth Rate	37.12
Annual Growth Rate	3.09

Sl.No.	Year	East Coast Tall
1	2010-11	13127
2	2011-12	13533
3	2012-13	13951
4	2013-14	14382
5	2014-15	14826
6	2015-16	15284
7	2016-17	15757
8	2017-18	16244
9	2018-19	16745
10	2019-20	17263
11	2020-21	17796
12	2021-22	18346
13	2022-23	18913

Source: Joint Director of Agriculture office, Thoothukudi

Table 3.13.1 Projected Increase in Yield and Production of Coconut (2011-12 to 2022-23)

Details	Quantity	Units
Area under coconut	5876	ha
Production	67300000	Nos.
Yield	11453.37	Nos.
Doubling the Production	134600000	Nos.
Yield	22906.74	Nos.

Sl.No.	Particulars	East Coast Tall	Total
1	Proportion of Varieties	1	1
2	Area	5876	5876
3	2011-12	79517700	79517700.4
4	2012-13	81974797	81974797.3
5	2013-14	84507819	84507818.6
6	2014-15	87119110	87119110.2
7	2015-16	89811091	89811090.7
8	2016-17	92586253	92586253.4
9	2017-18	95447169	95447168.6
10	2018-19	98396486	98396486.1
11	2019-20	101436938	101436938
12	2020-21	104571339	104571339
13	2021-22	107802593	107802593
14	2022-23	111133693	111133693

Source: Deputy Director of Horticulture office, Thoothukudi

Coconut is grown in an area of 5876 ha and the overall yield gap estimated was 4873 ha. The bridging up of the yield gap would result in the gradual increase in coconut production from 79517700 nos. in 2011-12 to 111133693 nos. in 2022-23 (Table 3.13 and 3.13.1).

Table 3.14Existing and Projected Yield and Production of Banana in ThoothukudiDistrict

Variety	Yield GAP I	Yield GAP II	Overall YG
Poovan	7500	11500	20000
Local	9000	11000	22000

Ruling Varieties	Poovan	Local
Potential Yield	50000	45000
Progressive Farmer Yield	42500	36000
Average Yield	30000	23000
Overall Yield Gap	20000	22000
Required Growth Rate	66.67	95.65
Annual Growth Rate	5.56	7.97

Sl.No.	Year	Poovan	Local
1	2010-11	31000	25000
2	2011-12	32724	26993
3	2012-13	34543	29144
4	2013-14	36464	31467
5	2014-15	38491	33974
6	2015-16	40631	36682
7	2016-17	42890	39606
8	2017-18	45275	42762
9	2018-19	47792	46171
10	2019-20	50449	49850
11	2020-21	53254	53823
12	2021-22	56215	58113
13	2022-23	59341	62745

Source: Deputy Director of Horticulture office, Thoothukudi

Table 3.14.1 Projected Increase in Yield and Production of Banana

(2011-12 to 2022-23)

Details	Quantity	Units
Area under Banana	10016	ha
Production	559536	tonnes
Yield	55.86	tonnes
Doubling the Production	1119072	tonnes
Yield	111.73	tonnes

Sl.No.	Particulars	Poovan	Local	Total
1	Proportion of Varieties	0.5	0.5	1
2	Area	5008	5008	10016
3	2011-12	163880	135178	299058.2
4	2012-13	172992	145952	318943.7
5	2013-14	182610	157585	340194.4
6	2014-15	192763	170144	362907
7	2015-16	203481	183705	387185.1

Sl.No.	Particulars	Poovan	Local	Total
8	2016-17	214794	198346	413139.8
9	2017-18	226737	214154	440890.6
10	2018-19	239343	231222	470565.2
11	2019-20	252651	249650	502301.1
12	2020-21	266698	269548	536245.6
13	2021-22	281526	291030	572557
14	2022-23	297179	314226	611405

Source: Deputy Director of Horticulture office, Thoothukudi

In Thoothukudi district, banana is cultivated in an area of 10016 ha. Mostly Poovan and local varieties were grown in the district and the yield gap estimated was 20000 and 22000 tonnes/ ha by the Poovan and local varieties, respectively. The increase in production by bridging this yield gap from 299058 tonnes/ ha (2011-12) to 611405 tonnes/ ha (2022-23) (Table 3.3.21 and 3.3.22).

Table 3.15 Existing and Projected Yield and Production of Chilies in Thoothukudi District

Variety	Yield GAP I	Yield GAP II	Overall YG
Local	1199	360	1559
K1	500	800	1300

Ruling Varieties	Local	K1
Potential Yield	2679	3000
Progressive Farmer Yield	1480	2500
Average Yield	1120	1700
Overall Yield Gap	1559	1300
Required Growth Rate	139.20	76.47
Annual Growth Rate	11.60	6.37

Sl.No.	Year	Local	K 1
1	2010-11	1120	1700
2	2011-12	1250	1808
3	2012-13	1395	1923
4	2013-14	1557	2046
5	2014-15	1737	2176
6	2015-16	1939	2315
7	2016-17	2164	2462
8	2017-18	2415	2619
9	2018-19	2695	2786

Sl.No.	Year	Local	K 1
10	2019-20	3007	2964
11	2020-21	3356	3152
12	2021-22	3746	3353
13	2022-23	4180	3567

Source: Deputy Director of Horticulture office, Thoothukudi

Table 3.15.1 Projected Increase in Yield and Production of Chilies

(2011-12 to 2022-23)

Details	Quantity	Units
Area under Chilies	11664	ha
Production	2058	tonnes
Yield	0.18	tonnes
Doubling the Production	4116	tonnes
Yield	0.35	tonnes

Sl.No.	Particulars	Local	K 1	Total
1	Proportion of Varieties	0.9	0.1	1
2	Area	10498	1166	11664
3	2011-12	13121	2109	15230
4	2012-13	14643	2244	16887
5	2013-14	16342	2386	18728
6	2014-15	18237	2538	20776
7	2015-16	20353	2700	23053
Sl.No.	**Particulars**	**Local**	**K 1**	**Total**
8	2016-17	22714	2872	25586
9	2017-18	25349	3055	28404
10	2018-19	28289	3250	31539
11	2019-20	31571	3457	35028
12	2020-21	35233	3677	38910
13	2021-22	39320	3911	43231
14	2022-23	43881	4160	48042

Source: Deputy Director of Horticulture office, Thoothukudi

Chilies are commonly grown in the district in an area of 11664 ha. The overall yield gap estimated was 1559 and 1300 t/ha for local and K1 varieties, respectively. The bridging up of the yield gap would result in the gradual increase in Chilies production from 15230 t/ha in 2011-12 to 48042 t/ha in 2022-23 (Table 3.15 and 3.15.1).

Table 3.16 Projected Crop Output based on Potential Yield

Sl.No.	Crops	Projected Area (ha)	Potential yield (kg)	Projected Output (tonnes)
1	Paddy	20933	5750	120365
2	Blackgram	55275	775	42838
3	Greengram	81933	825	67595
4	Maize	23320	8000	186560
5	Cumbu	9547	3600	34369
6	Banana	9819	50000	490950
7	Chilies	11599	2679	31074
8	Cholam	8027	7600	61005
9	Coconut *	6920	18000	1246
10	Cotton	1469	2350	3452
11	Sunflower	1085	1950	2116
12	Gingelly	1650	650	1073

**Nuts in lakhs*

Source: Season and Crop Report (1986-87 to 2010-11), Department of Economics and Statistics, Government of Tamil Nadu.

3. 4 Technologies Interventions and Strategies to Reduce Yield Gap

Table 3.17 Technologies Interventions and Strategies to Reduce Yield Gap

Major crops& enterprises being practiced in the district	Implementing Blocks	Prioritized problems in these crops/ enterprise	Title of Intervention	Technology Option and proposed intervention
Paddy	Thoothukudi Srivaikundam Karunkulam Thiruchendur Udangudi Alvarthirunagari Sathankulam	To reduce the yield gap	Enhancing Paddy Cultivation	SRI, protray, MN mixture, green manure seeds, IPM, Capacity building (CB)
Pulses	Thoothukudi Srivaikundam Karunkulam Alvarthirunagari Ottapidaram Kovilpatti Kayatar Villathikulam Pudhur	To supply the demand and supply the quality seeds	Enhancing Pulses Cultivation	Seeds & distribution, MN mixture, crop booster, CB, DAP spray
Cotton	Karunkulam Ottapidaram Kovilpatti	To encourage native cotton	Enhancing cotton cultivation	Demonstration on IPT

Major crops& enterprises being practiced in the district	Implementing Blocks	Prioritized problems in these crops/ enterprise	Title of Intervention	Technology Option and proposed intervention
	Kayatar Villathikulam Pudhur			
Millets	Thoothukudi Ottapidaram Kovilpatti Kayatar Villathikulam Pudhur	To reduce cost of cultivation	Enhancing Millets Cultivation	Seeds & distribution, MN mixture, crop booster, CB
Banana	Thoothukudi Srivaikundam Thiruchendur	To enhance farm income	Increasing the Productivity and Production of Banana	Precision Farming, IPM, Water Soluble Fertilizer, MN Mixture, Banana Sleeves
Chilli	Kovilpatti Villathikulam Pudhur	To enhance production with less cost of cultivation	Increasing the Productivity and Production of Chilies	Precision Farming, INM & IPM, Supply of Silpaulin sheet
Oilseeds	Udangudi Sathankulam	To enhance production	Enhancing Oilseeds Cultivation	Seeds & distribution, MN mixture, crop booster, CB, Gypsum
Vegetables	Karunkulam Ottapidaram Kovilpatti Villathikulam Pudhur	To supply the requirement of vegetables all through the year	Increasing the Productivity and Production of Vegetables	Quality Seed Supply, Precision Farming, INM and IPM, Providing Pandal/Support systems, Establishment of Community Nursery and Low cost Onion Storage unit

Emerging issues

- The productivity achieved in crops like paddy, millets, pulses, cotton, oilseeds, coconut, banana and chilies has to be sustained/ enhanced.
- There is a need for introducing labour saving and water saving technologies. Awareness should be created on farm mechanization
- Production and distribution of quality seeds/ hybrids, popularisation of improved technologies in pulses, soil health improvement techniques, precision farming technology should be disseminated for enhancing productivity.
- Promoting allied agricultural activities such as animal husbandry, fisheries should be carried out in the district.
- Strengthening of extension activities through technology demonstration, production of short film in modern technology, farmers training, exposure visits within and outside the state, etc.,
- Modernization of agricultural marketing infrastructures as well as strengthening rural shandies, commodity group formation, training farmers in marketing and storage etc.

CHAPTER IV

DISTRICT PLAN

Agriculture plays a dominant part in the overall economic scenario of India. Agriculture not only provides food and raw material but also employment opportunities to a very large proportion of population. It plays a vital role in the food and nutritional security of the people as well as in earning foreign exchange through export of raw and value added agricultural crops. The farmers are interested in growing different crops by adopting latest technological interventions and which were found to be remunerative.

4.1 Agriculture sector

4.1.1 Enhancing rice cultivation in Thoothukudi district

In Thoothukudi district, the normal area under rice is about 14,415 ha. The yield of paddy is around 5.4 tonnes/ ha. Yield gap analysis indicated the potentials for increasing the yield of rice and hence the following project is proposed. Rice is one of the major food grains of our state. However, the area under paddy is decreasing due to non availability of suitable varieties in proper season to all farmers. As well as Thoothukudi is an industrial developing district, the labour scarcity is high. Hence, it is important to increase the production and productivity by maximizing the area by supplying inputs in proper season, utilizing the machineries to avoid the labour scarcity and motivating the farming community to adopt the recent scientific technologies such as SRI through awareness campaigns will minimize the total cost of cultivation and helps retain the profitability to the farmers

Project components

1. Promotion of SRI was covered in Karungulam,Kayathar, Tirchendur and Udangudi block in Thootukudi district.
2. Distribution of foundation and certified seeds are covered in Karungulam, Kayathar, Tirchendur and Udangudi, Thootukudi, Srivaikundam and Sathankulam block in thootukudi district.
3. Distribution of MN mixture in biofertilizer are covered in Alwarthirunagiri,karungulam, tirchendur and Srivaikundam whereas in zinc sulphate are covered in Alwarthirunagiri, Karungulam, Thootukudi, Srivaikundam and Tirchendur blocks in Thoothukudi district.
4. Distribution of biofertilizer, zinc sulphate and biocontrol agents/biopesticides are covered in Alwarthirunagiri, Srivaikundam and Tirchendur block.
5. Gypsum application distribution of herbicides hybrid rice seed distribution and Polyvinyl coated tarpaulin (6m x 5m) are covered in tirchendur block.

Budget

The budget requirement for fulfilling the various interventions is ₹ 2333.61 lakhs. The details of budget requirement for each intervention across the blocks are shown in Table 4.1.

Expected outcome

To enhance the production and productivity of rice through adoption of improved methods in cultivation, farm machineries and the supply of inputs. It will increase the production of paddy by 10 to 15 per cent.

Implementing agency

The projects will be implemented by the Department of Agriculture.

Table 4.1. Budget requirement for rice in Thoothukudi district

(₹ in Lakhs)

Sl. No	Interventions	Blocks covered	Unit	Unit Cost	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
1	Promotion of SRI	B1, B2, B9, B10	Ha.	15000	0	0.00	1730	259.50	1770	265.50	1810	271.50	1875	281.25	7185	1077.75
2	Distribution of High Yielding Varieties	B1, B2, B6, B8, B9, B10	MT	35000	12	4.20	121	42.46	129	45.08	148	51.91	157	55.06	568	198.70
3	Distribution of Foundation	B1, B2, B5, B8, B9,B10	MT	4000	3.4	0.14	10	0.38	10	0.39	33	1.33	34	1.34	89	3.58
4	seed production - Foundation	B2 & B9	MT	3200		0.00	4	0.11	4	0.13	4	0.14	5	0.15	16	0.52
5	seed production - Certified class	B1, B2, B8, B9 & B10	MT	2600	10	0.26	81	2.10	89	2.32	101	2.62	107	2.77	387	10.06
6	Incentives for paddy machine planting	B1, B2, B9,B10	Ha.	1000	0	0.00	680	6.80	720	7.20	770	7.70	840	8.40	3010	30.10
8	Distribution of MN mixture/ Copper Sulphate	B1, B2, B9 & B10	Ha.	1000	300	3.00	1565	15.65	1598	15.98	1657	16.57	1715	17.15	6835	68.35
9	Distribution of Zinc sulphate (Soil application & foliar)	B1, B2, B9 & B10	Ha.	300	300	0.90	1590	4.77	1630	4.89	1705	5.12	1775	5.33	7000	21.00
10	Distribution of Zinc sulphate	B1, B2, B6, B9 & B10	Ha.	1000	800	8.00	1798	17.98	1844	18.44	1882	18.82	1920	19.20	8244	82.44
11	Distribution of biocontrol agents/ biopesticides	B1, B9 & B10	Ha.	1000	0	0.00	235	2.35	280	2.80	305	3.05	353	3.53	1173	11.73
12	Gypsum application	B9	Ha.	1500	0	0.00	15	0.23	18	0.27	20	0.30	25	0.38	78	1.17
13	Distribution of herbicides	B1, B2, B6, B9 & B10	Ha.	1000	400	4.00	1505	15.05	1512	15.12	1519	15.19	1531	15.31	6467	64.67
14	Hybrid Rice seed distribution	B2	Ha.	4000	0	0.00	2000	80.00	2000	80.00	2000	80.00	2000	80.00	8000	320.00
15	Polyvinyl coated Tarpaulin (6m x 5m)	B1 & B10	No.	2000	0	0.00	60	1.20	87	1.74	114	2.28	141	2.82	402	8.04
16	Demonstration of drip irrigation	All Blocks	Ha	100000	20	20.00	20	20.00	20	20.00	20	20.00	20	20.00	100	100.00
	Total					**41.30**		**538.68**		**555.51**		**587.29**		**610.83**		**2333.61**

Alwarthirunagiri - B1, Karungulam - B2, Kayathar - B3, Kovilpatti - B4, Ottapidaram - B5, Thoothukudi - B6, Pudur - B7, Sathankulam - B8, Srivaikundam - B9, Tirchendur - B10, Udangudi - B11, Vilathikulam - B12

4.1.2 Enhancing millets productivity in Thoothukudi district

In Thoothukudi district, the normal area under millet is about 56,524 ha. The yield in millet is about 1.3 tonnes/ ha of cholam, 1.5 t/ha of cumbu, 3.9 tonnes/ ha of ragi and 2 t/ha of maize. Yield gap analysis indicated the potentials for increasing the yield in millet crop and hence the following project is planned. The millets are considered to have been cultivated in India from pre-historic times. Millets are rich in B vitamins, calcium, iron, potassium, magnesium, zinc, also gluten-free and has low-GI (Glycemic index). Apart from being nutritious, millet can also bridge the food gap likely to be created by the implementation of a food security law. The non-availability of suitable varieties and hybrids of dry land millet crop is the major problem in this district.

Project components

1. Distribution of LPG operated bird scarrer are covered in vilatikulam block.
2. Distribution on biofertilizer - Liquid / Carrier covered in Karungulam, Kayathar, Thoothukudi and Vilatikulam block.
3. Expansion of area under Minor Millets (Demo - supply of seed, seed treatment & MN mixture) are covered in Pudur and Vilatikulam block.
4. Demonstration (supply of seed, seed treatment & MN mixture), Herbicides were covered in pudur block.
5. Seed distributions are covered in Karungulam block.
6. Distribution of Maize maxim (15 kg/ha) ws covered in Kayathar, Kovilpati and Pudur block.

Budget

The budget requirement for fulfilling the various interventions is ₹ 1345.02 lakhs. The details of budget requirement for each intervention across the blocks are shown in Table 4.2.

Expected outcome

The outcome will be increase in area of the crop. The productivity can be enhanced through high yielding varieties, micro nutrient mixtures and hi-tech interventions.

Implementing agency

The projects will be implemented by the Department of Agriculture.

Table 4.2. Budget requirement for millets in Thoothukudi district

(₹ in lakhs)

Sl. No.	Components	Unit	Unit cost	Blocks covered	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
	Millets															
1	Distribution of LPG operated Bird Scanner	Nos.	0.1	B12	0	0.00	50	5.00	50	5.00	100	10.00	100	10.00	300	30.00
2	Distribution on biofertilizer - Liquid / Carrier	Ha	0.003	B2, B3, B7 & B12	222	0.67	1400	4.20	1420	4.26	1620	4.86	1650	4.95	6312	18.94
3	Expansion of area under Minor Millets (Demo - supply of seed, seed treatment, MN mixture & Organic package)	Ha	0.05	B7 & B12	0	0.00	600	30.00	700	35.00	700	35.00	700	35.00	2700	135.00
4	Initiative for Nutritional Security through Intensive Millet Promotion (INSIMP)	ha	0.04		300	12.00	300	12.00	300	12.00	300	12.00	300	12.00	1500	60.00
	Sorghum															
5	Demonstration (Supply of seed, seed treatment, MN mixture & Organic package)	Ha	0.05	B7	0	0.00	100	5.00	100	5.00	100	5.00	100	5.00	400	20.00
6	Distribution of biofertilizers Liquid / Carrier	Ha	0.003	B2, B3, B7	444	1.33	225	0.68	225	0.68	225	0.68	225	0.68	1344	4.03
7	Distribution of MN mixture (12.5kg/ha)	Ha	0.007	B2, B3, B7	877	6.14	250	1.75	250	1.75	250	1.75	250	1.75	1877	13.14
8	Seed distribution	MT	0.7	B7	0	0.00	1	0.70	1	0.70	1	0.70	1	0.70	4	2.80
	Maize															
9	Demonstration (Supply of seed,	Ha	0.05	B5, B6, B7, B12	100	5.00	810	40.50	810	40.50	810	40.50	1310	65.50	3840	192.00

Sl. No.	Components	Unit	Unit cost	Blocks covered	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
	seed treatment & MN mixture, organic package)															
10	Distribution of biofertilizers Liquid / Carrier	Ha	0.003	B2, B3, B4, B5, B7 & B12	2790	8.37	1300	3.90	1300	3.90	1300	3.90	1800	5.40	8490	25.47
11	Distribution of herbicides	Ha	0.008	B7 & B12	0	0.00	550	4.40	550	4.40	550	4.40	1050	8.40	2700	21.60
12	Distribution of Maize maxim (15 kg/ha)	Ha	0.045	B2, B7 & B12	0	0.00	725	32.63	725	32.63	725	32.63	1225	55.13	3400	153.00
13	Seed Distribution Hybrid seeds for maize	MT	1.8	B7	0	0.00	2	3.60	2	3.60	2	3.60	2	3.60	8	14.40
	Cumbu															
14	Demonstration (supply of seed, seed treatment & MN mixture)	Ha	0.05	B5, B7,B12	100	5.00	850	42.50	850	42.50	850	42.50	850	42.50	3500	175.00
15	Distribution of biofertilizers Liquid / Carrier	Ha	0.003	B2, B3,B7	444	1.33	225	0.68	225	0.68	225	0.68	225	0.68	1344	4.03
16	Distribution of MN mixture (12.5kg/ha)	Ha	0.007	B2, B3, B4, B7	2356	16.49	800	5.60	800	5.60	800	5.60	800	5.60	5556	38.89
17	Seed Distribution	MT	0.53	B2, B3 & B7	0	0.00	206	109.18	206	109.18	206	109.18	206	109.18	824	436.72
	Total					**56.33**		**302.31**		**307.37**		**312.97**		**366.06**		**1345.02**

Alwarthirunagiri - B1, Karungulam - B2, Kayathar - B3, Kovilpatti - B4, Ottapidaram - B5, Thoothukudi - B6, Pudur - B7, Sathankulam - B8, Srivaikundam - B9, Tirchendur - B10, Udangudi - B11, Vilathikulam - B12

4.1.3 Enhancing pulses productivity in Thoothukudi district

In Thoothukudi district, the normal area under pulses is about 51949 ha. The yield in pulses is about 463.33 kg/ha for green gram, 432.67 kg/ha for black gram and 694 kg/ha for horse gram. Horse gram is the major producing pulses in Thoothukudi district. Yield gap analysis indicated the potentials for increasing the yield in pulses crop and hence the following project is proposed. A wide variety of pulses are grown globally, making them important both economically as well as nutritionally. Pulses are high in fiber, have low fat, no cholesterol, high protein, low glycemic index and high nutrient foods. Also, pulse is the least-cared crop by the farmers. By applying the latest technologies, the yield of pulses can be increased by 5-10 per cent.

Project components

1. Production of Foundation/Certified pulses seeds are covered in the all blocks except Kovilpatti and Udankudi block.
2. Distribution of Certified Seeds, biofertilizers, micronutrients and gypsum are covered in Thootukudi, Pudur, Vilatikulam,Kovilpati and Alwarthirunagari block.
3. Bund cropping and line sowing are covered in Vilatikulam, Kayathar, Thootukudi, Pudur, Vilatikulam and Alwarthirunagari block and Sathankulam block and line sowing were covered in all blocks except Pudur, Srivaikundam, Thiruchendur and Udankudi block.
4. Cropping system based demonstration are covered in Pudur, Vilatikulam,Ottaipidaram, Thoothukudi,Alwarthirunagiri and Sathankulam block.
5. DAP spray was covered in all blocks except Srivaikundam, Thiruchendur and Udankudi block.
6. Pulse wonder was covered in Vilatikulam, Thoothukudi, Alwarthirunagiri and Sathankulam block.

Budget

The budget requirement for fulfilling the various interventions is ₹ 6165.28 lakhs. The details of budget requirement for each intervention across the blocks are shown in Table 4.3.

Expected outcome

The outcome will be increase in area of the crop. The productivity can be enhanced through high yielding varieties, micro nutrient mixtures and hi-tech interventions

Implementing agency

The projects will be implemented by the Department of Agriculture.

Table 4.3. Budget requirement for Pulses in Thoothukudi district

(₹ in Lakhs)

Sl No	Interventions	Blocks covered	Unit	Unit cost	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
1	Production of Foundation/Certified pulses seeds	All Blocks except B4 & B11	MT	86000	154	132.44	272	233.92	272.6	234.44	273.2	234.95	294	252.84	1265.8	1088.59
2	Distribution of Certified Seeds	B1, B2, B3, B7 & B9	MT	100000	69	69.00	179	179.00	179.6	179.60	180.2	180.20	181	181.00	788.8	788.80
3	Distribution of Gypsum	B1 & B9	ha	400	0	0.00	70	0.28	85	0.34	95	0.38	100	0.40	350	1.40
4	Distribution of Biofertilizer/ Organic packages (Rhizobium + Phosphobacteria) - Liquid / Carrier	B1, B2, B5, B7, B8 & B9	Ha	600	1880	11.28	4025	24.15	4040	24.24	4055	24.33	4065	24.39	18065	108.39
5	Distribution of Micro Nutrients(5 kgs/ Ha)	B2, B7 & B9	Ha	350	250	0.88	2245	7.86	2250	7.88	2255	7.89	2255	7.89	9255	32.39
6	DAP Spray	All Blocks except B8, B10 & B11	Ha	700	8900	62.30	11450	80.15	11495	80.47	11560	80.92	11650	81.55	55055	385.39
7	Pulse wonder - 5 kg/ha	B2, B7, B9 & B12	Ha	1000	200	2.00	2720	27.20	3225	32.25	3230	32.30	4230	42.30	13605	136.05
8	Bund Cropping	B1, B2, B4, B7, B9 & B12	Ha	300	1090	3.27	1320	3.96	1445	4.34	1460	4.38	1480	4.44	6795	20.39
9	Line sowing	All Blocks except B1, B8, B10 & B11	Ha	2250	9000	202.50	12620	283.95	13675	307.69	13680	307.80	13730	308.93	62705	1410.86
10	Distribution of Yellow sticky trap /pheromone trap	B1, B2, B7 & B9	ha	1000	200	2.00	2270	22.70	2285	22.85	2300	23.00	2310	23.10	9365	93.65
11	Cropping system based demonstration	B1, B2, B5, B7, B9 & B12	Ha	12500	5	0.63	1529	191.13	2536	317.00	2542	317.75	2543	317.88	9155	1144.38
12	Distribution of weedicide	B2, B4, B5, B6, B7, B9 & B12	Ha	1000	1200	12.00	4320	43.20	4325	43.25	5330	53.30	5330	53.30	20505	205.05
13	Plant Protection Chemicals	B1, B2, B4, B5, B7, B9 & B12	Ha	1000	2700	27.00	4780	47.80	4805	48.05	5810	58.10	5830	58.30	23925	239.25
14	Seed treatment & soil application with Trichoderma	B1, B2, B3, B5, B7 & B9	Ha	700	7600	53.20	2740	19.18	2749	19.24	2760	19.32	2770	19.39	18619	130.33

Sl No	Interventions	Blocks covered	Unit	Unit cost	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
	viridi															
15	Pure crop demonstration - Black gram and green gram	B1, B2, B5, B7 & B12	Ha	6300	300	18.90	1020	64.26	1124	70.81	1130	71.19	1340	84.42	4914	309.58
16	Demonstration on intercropping of pulses with other crops	B1 & B7	Ha	8300	100	8.30	105	8.72	106	8.80	108	8.96	110	9.13	529	43.91
17	Demonstration on pulses production	B7	Ha	8250	50	4.13	50	4.13	50	4.13	50	4.13	50	4.13	250	20.63
18	Promotion of Redgram Transplantation for nursery preparation	B7	Ha	5000	25	1.25	25	1.25	25	1.25	25	1.25	25	1.25	125	6.25
	Grand total					**611.07**		**1242.82**		**1406.61**		**1430.15**		**1474.63**		**6165.28**

Alwarthirunagiri - B1, Karungulam - B2, Kayathar - B3, Kovilpatti - B4, Ottapidaram - B5, Thoothukudi - B6, Pudur - B7, Sathankulam - B8, Srivaikundam - B9, Tirchendur - B10, Udangudi - B11, Vilathikulam - B12

4.1.4 Enhancing oilseeds productivity in Thoothukudi district

Oilseeds constitute a very important group of commercial crops in India. In Thoothukudi district, the normal area under oilseeds is about 1019.75 ha. The productivity in oilseeds is around 3 t/ha for groundnut, 188 kg/ha for Gingelly 1 t/ha for sunflower. The oil extracted from oilseeds forms an important item of our diet and used as raw materials for manufacturing large number of items. They occupy the second place after food grains as a farm commodity. They form an important export item. The main problem in oil seeds development is non-availability of quality seeds to all areas of ground nut and non availability of sunflower hybrids in Agriculture Department and the seed is more costlier in private firms. Thus the overall goal is to increase the yield of oilseeds through new technologies and the supply of inputs like gypsum.

Project components

1. Polythene mulch Inclusive of erection was covered in Alwarthirunagiri block in Thoothukudi district.
2. Castor as bund crop is covered in Alwarthirunagiri block, Sathankulam and Udankudi block in Thoothukudi district.
3. Production and distribution of foundation and certified seed is covered in Alwarthirunagiri block, Srivaikundam and Udankudi block in Thoothukudi district.
4. Application of micronutrients to groundnut was covered in Alwarthirunagiri block, Srivaikundam and Udankudi block and liquid light trap was covered in Alwarthirunagiri, Srivaikundam and Udankudi blocks in thoothukudi district.
5. Application of gypsum to groundnut was covered in are covered Alwarthirunagiri block, Srivaikundam and Udankudi block in Thoothukudi district

Budget

The budget requirement for fulfilling the various interventions is ₹ 347.26 lakhs. The details of budget requirement for each intervention across the blocks are shown in Table 4.4.

Expected outcome

The implementation of the project will increase the productivity of crop by the adoption of advanced crop management strategies.

Implementing agency

The projects will be implemented by the Department of Agriculture.

Table 4.4. Budget requirement for Oilseeds in Thoothukudi district

(₹ in lakhs)

Sl. No	Components	Blocks covered	Unit	Unit Cost	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
1	Polythene mulch Inclusive of erection	B1	Ha	50000	0	0.00	2	1.00	4	2.00	4	2.00	6	3.00	16	8.00
2	Herbicide	B7, B8 & B11	Ha	1000	50	0.50	77	0.77	85	0.85	95	0.95	105	1.05	412	4.12
3	Light trap (NCIPM)	B7	Nos.	1000	50	0.50	50	0.50	50	0.50	50	0.50	50	0.50	250	2.50
4	Bio pesticide/fungicide	B1 & B7	Ha	1000	100	1.00	105	1.05	108	1.08	110	1.10	112	1.12	535	5.35
5	Compact Block Demonstration - Groundnut	B1, B8 & B11	Ha	20000	0	0.00	82	16.40	92	18.40	109	21.80	121	24.20	404	80.80
6	Compact Block Demonstration - Sunflower	B7	Ha	8000	50	4.00	50	4.00	50	4.00	50	4.00	50	4.00	250	20.00
	GROUNDNUT															
7	Strengthening seed chain by foundation seed production	B11	Mt	76000	0	0.00	2.75	2.09	3.02	2.30	3.27	2.49	3.6	2.74	12.64	9.61
8	Strengthening seed chain by certified seed production	B1, B8 & B11	Mt	73000	15	10.95	18.25	13.32	20.02	14.61	23.27	16.99	26.1	19.05	102.64	74.93
9	Distribution of Certified seeds	B1, B8 & B11	Mt	8400	10	8.40	22.1	18.56	24.27	20.39	29	24.36	32.5	27.30	117.87	99.01
10	Distribution of Seed Treatment Chemicals and Bioagents (T.Viridi)	B1, B8 & B11	Kg	150	0	0.00	125	0.19	156	0.23	193	0.29	235	0.35	709	1.06
11	Application of Gypsum to Groundnut Crop	B1, B8 & B11	Ha	1600	0	0.00	52	0.83	60	0.96	72	1.15	85	1.36	269	4.30
12	Distribution of Micro Nutrient Mixture	B1, B8 & B11	Ha	1500	0	0.00	37	0.56	42	0.63	51	0.77	61	0.92	191	2.87
13	Distribution of Biofertilizer	B8 & B11	Ha	600	150	0.90	80	0.48	92	0.55	103	0.62	110	0.66	535	3.21
14	Distribution of Liquid Biofertilizer	B1, B8 & B11	Ha	600	75	0.45	162	0.97	175	1.05	189	1.13	205	1.23	806	4.84
15	Distribution of Pheromone Traps	B8 & B11	Nos.	2000	0	0.00	52	1.04	65	1.30	78	1.56	100	2.00	295	5.90
16	Distribution of Light Traps	B1, B8 & B11	Nos.	2000	0	0.00	54	1.08	68	1.36	84	1.68	110	2.20	316	6.32

Sl. No	Components	Blocks covered	Unit	Unit Cost	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
17	Castor as Bund crop	B1, B8 & B11	Ha	600	20	0.12	35	0.21	37	0.22	41	0.25	46	0.28	179	1.07
18	Combined Nutrient Spray	B8 & B11	Ha	1500	0	0.00	21	0.32	25	0.38	29	0.44	35	0.53	110	1.65
19	Seed Drill Sowing / Line sowing of Groundnut with Pulses as intercrop(hiring charges only)	B1	Ha	3000	0	0.00	40	1.20	45	1.35	50	1.50	60	1.80	195	5.85
	SUNFLOWER															
20	Production of Certified Seeds	B7	Mt	50000	0.5	0.25	0.5	0.25	0.5	0.25	0.5	0.25	0.5	0.25	2.5	1.25
21	Distribution of certified seeds	B7	Mt	57000	0.5	0.29	0.5	0.29	0.5	0.29	0.5	0.29	0.5	0.29	2.5	1.43
	GINGELLY															
22	Distribution of Micro nutrients (Manganese sulphate/ Zinc sulphate)	B2	Ha	400	0	0.00	200	0.80	200	0.80	200	0.80	200	0.80	800	3.20
	Grand total					**27.36**		**65.90**		**73.49**		**84.90**		**95.61**		**347.26**

Alwarthirunagiri - B1, Karungulam - B2, Kayathar - B3, Kovilpatti - B4, Ottapidaram - B5, Thoothukudi - B6, Pudur - B7, Sathankulam - B8, Srivaikundam - B9, Tirchendur - B10, Udangudi - B11, Vilathikulam - B12

4.1.5. Oil palm

Enhancing the productivity of Oil palm

India is the largest consumer of palm oil in the world, consuming around 17 per cent of total world consumption. India is also the largest importer of palm oil amounting to 44 per cent of world imports. Palm Oil is extracted from the pulpy portion (monocarp) of the fruit of Oil Palm. The Crude Palm Oil is deep orange red in colour and is semi solid at a temperature of 20 degree celsius. Palm Oil contains an equal proportion of saturated and unsaturated fatty acid containing about 40 per cent oleic acid, 10 per cent linoleic acid. 44 per cent palmitic acid and 5 per cent stearic acid. The unprocessed palm oil is used for cooking in various countries. Palm Oil is a very rich source of Beta Carotene, an important source of Vitamin A and it contains Tecopherols and Tocotrienols, a natural source of Vitamin E. Vitamin A and Vitamin E contents are the highest in palm oil in comparison with any other types of oil and hence consumption of the same boosts health. By virtue of the high vitamin contents the Red Palm Oil is a nature's gift for the human beings. In view of the rich content of vitamins, palm oil can be utilized for the preparation of cosmetics as well there is a need to promote oil palm by the way of area expansion and better cultivation practices, it is equally important to focus on innovative growth strategies through National Mission on Oilseeds and Oil Palm (NMOOP) has been launched in which Mini Mission-II (MM-II) is dedicated to oil palm area expansion and productivity increases. MM-II of NMOOP and MM-III of NMOOP is being implemented in 13 States viz; Tamil Nadu, Andhra Pradesh, Assam, Arunachal Pradesh, Chhattisgarh, Gujarat, Karnataka, Kerala, Mizoram, Nagaland, Odisha, Telangana, and West Bengal.

Project components

- Oil palm area expansion programme were covered in all blocks of thoothukudi district.
- Inputs for intercropping were covered in all blocks of thoothukudi district
- Supply of diesel pumps were covered in all blocks of thoothukudi district
- Supply of aluminium ladder, wire mesh and oil palm cuter were covered in all blocks of thoothukudi district

Budget

It is proposed to incur ₹.62.15 lakhs over a period of five years with the finance facilities under the NADP and other sources.

Expected outcome

The expected outcome of the project will result in an increase in the production of oil palm for producing oil and major supply of quality raw material to the oilseed industry which will improve the income of the farmers and requirement of oilseeds.

Implementing Agency

Department of Agriculture will implement the project and report the progress to the District-level officials.

Table 4.5. Enhancing the productivity of Oil palm in Thoothukudi district

(₹ in Lakhs)

Sl. No	Components	Blocks covered	Unit	Unit Cost	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
	NMOOP -Mini Mission -III (Tree Borne Oilseeds)															
1	Neem/ Pungam Area Expansion Programme	All Blocks	Ha	20000	37	7.40	33	6.60	27	5.40	27	5.40	27	5.40	151	30.20
2	Cultivation maintenance	All Blocks	Ha	5000	177	8.85	40	2.00	29	1.45	27	1.35	27	1.35	300	15.00
3	Inputs for Intercropping	All Blocks	Ha	5000	216	10.80	40	2.00	29	1.45	27	1.35	27	1.35	339	16.95
	Grand total					**27.05**		**10.60**		**8.30**		**8.10**		**8.10**		**62.15**

Alwarthirunagiri - B1, Karungulam - B2, Kayathar - B3, Kovilpatti - B4, Ottapidaram - B5, Thoothukudi - B6, Pudur - B7, Sathankulam - B8, Srivaikundam - B9, Tirchendur - B10, Udangudi - B11, Vilathikulam - B12

4.1.6. Cotton

Enhancing the productivity of Cotton

Cotton is the most important fiber crop of India. It provides the basic raw material (cotton fibre) to cotton textile industry. Its seed (binola) is used in vanaspati industry and can also be used as part of fodder for milch cattle to get better milk. The reduction in the area under cotton is mainly due to the increased cost of cultivation because of the high cost of labour and plant protection in the cultivation of cotton. Cotton is susceptible to many insects and pests. Though HYV seeds and hybrid seeds are available in the market and the eradication of disease is not achievable. Alternatively, production of cotton can be increased through varying cultivation practices that could achieve sustainable development.

Project components

- Demonstration of IPT were conducted in Alwarthirunagiri block.
- Distribution of intercrop seeds are given to Karungulam,Kovilpati and Pudur blocks.
- Distribution of yellow sticky traps in Alwarthirunagiri, Pudur and Sathankulam blocks.
- Trials on High Density Planting system in cotton was covered in Karungulam block.
- Providing plant protection measures in alwar and Pudur blocks.
- Distribution of cotton picking machine was covered in alwar and Karungulam blocks.
- Field days were covered in Alwarthirunagiri, Karungulam and Pudur block and exposure visits was covered in Karungulam and Kovilpatti blocks.

Budget

It is proposed to incur ₹.259.67 lakhs over a period of five years with the finance facilities under the NADP and other sources as given in Table 4.6.

Expected outcome

The implementation of the above project will result in an increase in the productivity of cotton in Kinathukadavu and Annur blocks by during southwest monsoon and improved cotton technologies produce more cotton as well as supply of quality raw material to the textile industry which will improve the income of the farmers.

Implementing Agency

Department of Agriculture will implement the project

Table 4.6. Enhancing the productivity of Cotton

(₹ in Lakhs)

Sl. No	Components	Unit	Unit Cost	Blocks covered	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
1	Cotton seed treatment	Ha	300	B1, B2 & B7	50	0.15	205	0.62	208	0.62	210	0.63	212	0.64	885	2.66
2	Demonstration of IPT	Ha	15000	B1	0	0.00	1	0.15	2	0.30	2	0.3	2	0.30	7	1.05
3	Distribution of biofertilizer	Ha	300	B1, B2, B3, B4, B7 & B12	526	1.59	490	1.47	497	1.49	504	1.51	516	1.55	2533	7.60
4	Distribution of biopesticides / Bio agents	Ha	1000	B2, B3, B7 & B12	526	5.26	380	3.80	385	3.85	390	3.90	400	4.00	2081	20.81
5	Distribution of cotton picking machine	No	5000	B1 & B2	0	0.00	4	0.20	5	0.25	6	0.30	7	0.35	22	1.10
6	Distribution of MN Mixture	Ha	1000	B1, B2, B3, B4, B7 & B12	526	5.26	490	4.90	497	4.97	504	5.04	516	5.16	2533	25.33
7	Distribution of Pheromone trap	No	6000	B1	0	0.00	10	0.60	12	0.72	14	0.84	16	0.96	52	3.12
8	Distribution of PP chemicals	Ha	1000	B1, B2, B3, B4, B7, B8 & B12	526	5.26	500	5.00	507	5.07	514	5.14	526	5.26	2573	25.73
9	Distribution of Yellow Sticky trap	No	3000	B1, B7 & B8	50	1.50	70	2.10	72	2.16	74	2.22	76	2.28	342	10.26
10	Exposure visits	No	40000	B2 & B4	0	0.00	4	1.60	4	1.60	4	1.60	4	1.60	16	6.40
11	Farmers training	No	20000	B1, B2, B4 & B7	1	0.20	6	1.20	7	1.40	7	1.40	8	1.60	29	5.80
12	Field days	No	10000	B1, B2 & B7	1	0.10	3	0.30	4	0.40	4	0.40	5	0.50	17	1.70
13	Intercropping with pulses	Ha	10000	B2, B4 & B7	50	5.00	101	10.10	101	10.10	101	10.10	101	10.10	454	45.40
14	TNAU Cotton plus distribution (6 Kg./ Ha)	Ha	1200	B2	0	0.00	50	0.60	50	0.60	50	0.60	50	0.60	200	2.40
15	Frontline demo on ICM in cotton	Ha	7000	B1	0	0.00	1	0.07	2	0.14	2	0.14	2	0.14	7	0.49
16	Trials on High	Ha	9000	B2	0	0.00	50	4.50	50	4.50	50	4.50	50	4.50	200	18.00

Sl. No	Components	Unit	Unit Cost	Blocks covered	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
	Density Planting system in cotton															
17	Application of weedicide	Ha	3000	B7	50	1.50	50	1.50	50	1.50	50	1.50	50	1.50	250	7.50
18	Spraying of growth regulator	Ha	3000	B1	0	0.00	10	0.30	12	0.36	14	0.42	16	0.48	52	1.56
19	Topping of cotton	Ha	1000	B1, B2 & B7	50	0.50	210	2.10	212	2.12	214	2.14	216	2.16	902	9.02
20	Summer ploughing	Ha	7500	B2 & B7	50	3.75	200	15.00	200	15.00	200	15.00	200	15.00	850	63.75
	Grand total					**30.58**		**56.11**		**57.16**		**57.68**		**58.67**		**259.67**

Alwarthirunagiri - B1, Karungulam - B2, Kayathar - B3, Kovilpatti - B4, Ottapidaram - B5, Thoothukudi - B6, Pudur - B7, Sathankulam - B8, Srivaikundam - B9, Tirchendur - B10, Udangudi - B11, Vilathikulam - B12

4.1.7. Enhancing sugarcane productivity

Sugarcane is a major cash crop in Tamil Nadu. Sustainable Sugarcane Initiative (SSI) is a method of sugarcane production that involves the use of fewer setts, less water and appropriate utilization of fertilizers to achieve higher yields. The goal is to create awareness about SSI technology among the farmers through transfer of the SSI technology by strengthening the extension system, providing the high yielding variety setts and other inputs at appropriate time and providing the machineries like sugarcane planter, detachers and harvesting machines.

Project components

1. Sustainable Sugarcane Initiative (SSI) is covered in all blocks except Pudur, Tirchendur, Udankudi and Vilatikulam blocks.
2. Distribution of micro nutrient mixture and gypsum were covered in alwarnagari, bio-fertilizers and water soluble fertilizers are covered in Srivaikundam block, $FeSO_4$ spray, $ZnSO_4$ and *Trichogramma* parasite in alwarnagari block.
3. Establishment of single bud seedling centre and drip irrigation were covered in all blocks except Pudur, Thirunchendur, Udankudi and Vilatikulam block.
4. Training to famers in Krunkulam and Srivaikundam block.
5. Trash mulching were covered in Alwarnagari block.
6. Distribution of portrays for preparing seedling in Alwarnagari blocks.
7. Distribution of shade net in Alwarnagari, Karungulam,Kayathar,Kovilpati and Srivaikundam.

Budget

The budget requirement for fulfilling the various interventions is ₹ 191.45 lakhs. The details of budget requirement for each intervention across the blocks are shown in Table 4.7.

Expected outcome

The supply of good quality seeds and planting materials like micronutrients, gypsum and bio-fertilizers will enhance the production and productivity of sugarcane. Increase in the production of sugarcane in the most sustainable way.

Implementing agency

The projects will be implemented by the Department of Agriculture.

Table 4.7. Enhancing the productivity of Sugarcane

(₹ in Lakhs)

Sl. No	Components	Unit	Unit Cost	Blocks covered	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
1	Distribution of Chip Cutter	Nos	5000	B1, B4 & B8	14	0.70	6	0.30	7	0.35	8	0.40	8	0.40	43	2.15
2	Distribution of FeSO4 Spray	Ha	500	B1	0	0.00	4	0.02	4	0.02	6	0.03	6	0.03	20	0.10
3	Distribution of ZnSO4 Spray	Ha	500	B1	0	0.00	2	0.01	3	0.02	4	0.02	5	0.03	14	0.07
4	Distribution of Parasite Trichogramma	Ha	125	B1	0	0.00	2	0.00	3	0.00	4	0.01	5	0.01	14	0.02
5	Distribution of Water Soluble Fertiliers	ha	25000	B8	0	0.00	10	2.50	15	3.75	20	5.00	25	6.25	70	17.50
6	Micro irrigation - Drip (1.2x0.6)	ha	124000	All Blocks except B7, B10, B11 & B12	0	0.00	12	14.88	24	29.76	14	17.36	25	31.00	145	93.00
7	A. Establishment of Shadenet	Nos	150000	B1, B2, B3, B4 & B8	7	10.50	2	3.00	7	10.50	6	9.00	8	12.00	30	45.00
8	B.Distribution of Single Bud Seedling	Ha.	22500	All Blocks except B7, B10, B11, B12	70	15.75	10	2.25	20	4.50	10	2.25	20	4.50	130	29.25
9	Trash Mulching	Ha	4000	B1	0	0.00	5	0.20	6	0.24	8	0.32	10	0.40	29	1.16
10	State Level training in Sugarcane cultivation	No	40000	B2 & B8	0	0.00	2	0.80	2	0.80	2	0.80	2	0.80	8	3.20
	Grand total					**26.95**		**23.96**		**49.94**		**35.19**		**55.41**		**191.45**

Alwarthirunagiri - B1, Karungulam - B2, Kayathar - B3, Kovilpatti - B4, Ottapidaram - B5, Thoothukudi - B6, Pudur - B7, Sathankulam - B8, Srivaikundam - B9, Tirchendur - B10, Udangudi - B11, Vilathikulam - B12

4.1.8 Enhancing coconut productivity in Thoothukudi district

Coconut is a main plantation crop. It is well known for its multi purposes and augmenting the production of coconut improves the availability of coconut. It also helps agriculture related industries to boost up their production with variety of products. In Thoothukudi district, coconut is grown in an area of 5963 ha. The cultural operations are very difficult because of its tall growing nature. Hence the introduction of high yielding hybrids (Tall × Dwarf) would add profit and increase the numbers and productivity of coconut trees. There is a scope for 5 percent increase of nuts yield of coconut by developing improved tall varieties or hybrids. Thus the overall objective will be is to enhance the coconut area and their productivity through the use of new hybrids.

Project components

1. Coconut seedling distribution – Tall seedlings are to be distributed in all blocks except vilatikulam
2. Coconut seedling distribution –Tall x Dwarf seedlings are to be distributed in all blocks except Vilatikulam
3. Distribution of Pheromone traps for Red palm weevil/ Rhinocerous beetle is for Alwarnagari, Udankudi and Vilatikulam.
4. Distribution of power operated rocker sprayer covered in Alwarnagari and Tirchendur blocks.
5. Distribution of coconut seedlings to school children is to be covered in Alwarnagari, Udankudi and Tirchendur blocks.
6. Thanjavur wilt management (root feeding /soil application) is covered in Tirchendur block.
7. Distribution of power operated rocker sprayer and solar drier are covered in Tirchendur block.

Budget

The total cost of the project for five years works to ₹ 1104.14 lakhs. The details of budget requirement for each intervention across the blocks are shown in Table 4.8.

Expected outcome

The implementation of the project will result in a minimum increase of coconut planting. This will help the coconut growing farmers to increase the area and productivity. This will help the employment opportunity and income of the farming community.

Implementing agency

The projects will be implemented by the Department of Agriculture.

Table 4.8. Budget requirement for coconut in Thoothukudi district

(₹ in lakhs)

Sl. No	Components	Blocks covered	Unit	Unit Cost	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
1	Distribution of T x D hybrid seedlings	All Blocks except B2	No	60	8600	5.16	9650	5.79	9850	5.91	10650	6.39	11050	6.63	49800	29.88
2	Distribution of Tall Seedlings	All Blocks except B2	No	40	4825	1.93	5625	2.25	6175	2.47	6625	2.65	6975	2.79	30225	12.09
3	Distribution of power operated coconut leaf shredder	B10	Nos	60000	1	0.60	1	0.60	1	0.60	1	0.60	1	0.60	5	3.00
4	Distribution of MN mixture	B1, B2, B10 & B11	Ha	10000	250	25.00	392	39.20	619	61.90	842	84.20	1177	117.70	3280	328.00
5	Distribution of Pheromone traps for Red palm weevil/ Rhinocerous beetle	B2, B10 & B11	Ha	1600	20	0.32	32	0.51	32	0.51	37	0.59	42	0.67	163	2.61
6	Distribution of power operated rocker sprayer	B1 & B10	Nos	10000	1	0.10	2	0.20	3	0.30	4	0.40	5	0.50	15	1.50
7	Distribution of Solar copra drier	B11	Nos	20000	1	0.20	1	0.20	1	0.20	1	0.20	1	0.20	5	1.00
8	Distribution of tree climbers	B8 & B10	Nos	15000	1	0.15	102	15.30	102	15.30	102	15.30	102	15.30	409	61.35
9	Drip irrigation	B1 & B2	Ha	35000	0	0.00	19	6.65	21	7.35	23	8.05	27	9.45	90	31.50
10	Intercropping with green manures	B1, B2, B10 & B11	Ha	3000	70	2.10	142	4.26	194	5.82	248	7.44	327	9.81	981	29.43
11	Replanting and Rejuvanation of coconut trees	B1 & B11	Ha	45000	10	4.50	12	5.40	12	5.40	14	6.30	14	6.30	62	27.90
12	Thanjavur wilt management (root feeding /soil application)	B10	Ha	3000	10	0.30	15	0.45	20	0.60	20	0.60	25	0.75	90	2.70
13	Demonstration on Integrated fertiliser management	B2, B8, B10 & B11	Ha	75000	20	15.00	121	90.75	131	98.25	136	102.00	146	109.50	554	415.50
14	Distribution of coconut seedlings to school children	B1, B10 & B11	No	40	700	0.28	1100	0.44	1400	0.56	1600	0.64	1950	0.78	6750	2.70

Sl. No	Components	Blocks covered	Unit	Unit Cost	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
15	Control of Eriophid mite	B1, B10 & B11	no. of tree	20	525	0.11	725	0.15	930	0.19	1630	0.33	2330	0.47	6140	1.23
16	Training on neera production	B8, B10 & B11	Batches	25000	1	0.25	3	0.75	4	1.00	3	0.75	4	1.00	15	3.75
	Collective Farming															
17	corpus fund release for FPG (2000 nos.)	B2, B3, B4, B5, B7, B10 & B12	Nos.	500000	29	145.00	0	0.00	1	5.00	0	0.00	0	0.00	30	150.00
	Grand total					**201.00**		**172.90**		**211.36**		**236.44**		**282.45**		**1104.14**

Alwarthirunagiri - B1, Karungulam - B2, Kayathar - B3, Kovilpatti - B4, Ottapidaram - B5, Thoothukudi - B6, Pudur - B7, Sathankulam - B8, Srivaikundam - B9, Tirchendur - B10, Udangudi - B11, Vilathikulam - B12

4.1.9. Training to farmers

Enhancing the livelihood of farmers through training

Agricultural extension is being provided at the Block level and below, under the Extension Reforms scheme being implemented. Contact them or any other functionary of the State Government in Agriculture and allied departments to get answers for the queries, information about any Programme / Scheme and appropriate technologies for the area or individual farmer. The new information that farmers gain through these training sessions makes their daily farming activities much easier. It also leads to an increase in productivity and bigger profits in the long run.

Project components

1. State level trainings to Extension officials are covered in all blocks.
2. State level and interstate level training programmes to farmers are covered in all blocks.
3. Exposure visits are covered in all blocks.

Budget

It is proposed to incur ₹. 252.50 lakhs over a period of five years with the finance facilities under the NADP and other sources was shown in the table 4.9

Expected outcome

The project will results better income to farmers. They may learn many things to improve their knowledge of cultivation if they listen this programme which will improve the income of the farmers.

Implementing Agency

Department of Agriculture will implement the project and report the progress to the District-level officials.

Table 4.9. Budget requirement for Training in Thoothukudi district

(₹ in lakhs)

Sl. No	Cafeteria of Activities	Unit	Unit Cost	Block Covered	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
	District Level															
	Training of Farmers															
1	Inter State Training of Farmers	Nos.	1.25	All Blocks	12	15.00	12	15.00	12	15.00	12	15.00	12	15.00	60	75.00
2	Training of 536 Groups of Seed Village Farmers in quality Seed Production technology.	Nos.	0.1	All Blocks	12	1.20	12	1.20	12	1.20	12	1.20	12	1.20	60	6.00
3	Training of Farmers under Mission Soil Health Card	Nos.	0.15	All Blocks	12	1.80	12	1.80	12	1.80	12	1.80	12	1.80	60	9.00
4	With in the district training of Farmers	Nos.	0.1	All Blocks	12	1.20	12	1.20	12	1.20	12	1.20	12	1.20	60	6.00
5	With in the State training of Farmers	Nos.	1.2	All Blocks	12	14.40	12	14.40	12	14.40	12	14.40	12	14.40	60	72.00
	Training of Farmers With in the district															
6	Awareness campaigns	Nos.	0.1	All Blocks	12	1.20	12	1.20	12	1.20	12	1.20	12	1.20	60	6.00
7	Groundnut	Nos.	0.1	B1, B4, B8 & B11	4	0.40	4	0.40	4	0.40	4	0.40	4	0.40	20	2.00
8	Major & Minor Millets	Nos.	0.1	B4, B7 & B12	3	0.30	3	0.30	3	0.30	3	0.30	3	0.30	15	1.50
9	Moisture conservation practices	Nos.	0.1	All Blocks	12	1.20	12	1.20	12	1.20	12	1.20	12	1.20	60	6.00
10	Organic cultivation practices	Nos.	0.1	All Blocks	12	1.20	12	1.20	12	1.20	12	1.20	12	1.20	60	6.00
11	Paddy	Nos.	0.1	All Blocks except B12	9	0.90	9	0.90	9	0.90	9	0.90	9	0.90	45	4.50
12	Pulses	Nos.	0.1	All Blocks	11	1.10	11	1.10	11	1.10	11	1.10	11	1.10	55	5.50
13	Sugarcane	Nos.	0.1	B1, B2, B3, B5, B6 & B8	5	0.50	5	0.50	6	0.60	5	0.50	5	0.50	26	2.60
14	Value addition training	Nos.	0.1	All Blocks	12	1.20	12	1.20	12	1.20	12	1.20	12	1.20	60	6.00

Sl. No	Cafeteria of Activities	Unit	Unit Cost	Block Covered	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
	Exposure visit of Farmers															
15	Rodent Pest Management Demonstration	Nos.	0.04	All Blocks	12	0.48	12	0.48	12	0.48	12	0.48	12	0.48	60	2.40
16	With in State Exposure visit	Nos.	0.4	All Blocks	12	4.80	12	4.80	12	4.80	12	4.80	12	4.80	60	24.00
17	Organisation of Kisangosthies on Soil test based nutrient application (Campaign)	Nos.	0.15	All Blocks	12	1.80	12	1.80	12	1.80	12	1.80	12	1.80	60	9.00
18	With in the district exposure visit	Nos.	0.15	All Blocks	12	1.80	12	1.80	12	1.80	12	1.80	12	1.80	60	9.00
	Total					**50.48**		**50.48**		**50.58**		**50.48**		**50.48**		**252.50**

Alwarthirunagiri - B1, Karungulam - B2, Kayathar - B3, Kovilpatti - B4, Ottapidaram - B5, Thoothukudi - B6, Pudur - B7, Sathankulam - B8, Srivaikundam - B9, Tirchendur - B10, Udangudi - B11, Vilathikulam - B12

4.1.10. Infrastructure

Facilities for Seed production

Seed is the most basic input in agriculture. Therefore, the sustained supply of the quality seeds will continue to be a key factor for augmenting agricultural growth. The seed processing is a vital part of the seed production activities and the State Government has accorded high priority. In view of above, efforts have to be taken with the objective of production of quality seeds of agricultural crops through scientific methods andadopting appropriate processing techniques through establishment and modernization of State seed processing plants.

After harvesting, cleaning, drying, processing, and packaging, the representative samples of seed lot are required to be taken and sent to the laboratory for quality testing. From the test results, genetic, physical, physiological, and health qualities of seeds are determined. Different countries have set their own standards to find out these qualities in the seed lot. The National Seed Board, for instance, has approved maximum amount of moisture content, minimum germination potential, and minimum physical purity in foundation, certified and truthfully labeled seeds of different crops as basic seed standards. The test results must conform the approved seed standards to send the seeds in the market for commercial transaction.

Establishment of Laboratories

Quality control is the process of checking the quality of the material against the standard set by the organizations and if the material does not match with the standards, then suchmaterial is said to be substandard. Quality control laboratories are being established by the Government with an intention to supply quality inputs viz., seed, fertilizers andpesticide and services like soil testing to the farmers. To have effective quality control of inputs, quality inspectors are to be appointed.

The Agricultural Research - NABL Accreditation lab, Organic Fertilizer Testing laboratory, Bio-Fertilizer Quality Control Laboratory, Pesticide Residual Laboratory and laboratory for leaf analysis for selective nutrient application, Soil Testing Laboratory and Fertilizer Control Laboratory, Strengthening of Mobile Soil Testing Laboratory for Ensuring Soil Health were proposed.

The major interventions are

1. Additional Seed Godown are covered in all blocks and Bag closure are covered in only Srivaikundam block.
2. Construction of IAEC with vehicle shed and compound wall was covered in Alwarthirunagiri, Kayathar, Kovilpati and Srivaikundam block.
3. Construction of Lignite storage/ storage Godowns are covered in srivaikundam block.
4. Construction of Organic Fertlizer Testing Lab and Construction of Sub-AEC in Srivaikundam block.
5. Construction of Uzhavar Maiyam/Farmers Hub in Udankudi block.
6. Dunnage, Electronic platform balance and Moisture meter was covered in all blocks except Pudur.
7. Establishment of Thrashing floor/drying yard in Karungulam and Pudur block.
8. Strengthening of BFQCL, CCL, FCL, MSTL, PTL and STL are covered in all blocks.

Budget

It is proposed to incur ₹.2201.23 lakhs over a period of five years with the finance facilities under the NADP and other sources was shown in the table 4.10.

Expected outcome

The projects will provide better facility to farmers. They may learn many things to improve their knowledge of cultivation if they listen this programme which will improve the income of the farmers.

Implementing Agency

Department of Agriculture will implement the project and report the progress to the District-level officials.

Table 4.10. Budget requirement for Infrastructure in Thoothukudi district

(₹ in lakhs)

Sl. No	Components	Blocks covered	Unit	Unit Cost	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
1	Seed godown (300 MT)	B9	Nos.	2500000	0	0.00	1	25.00	1	25.00	1	25.00	1	25.00	4	100.00
2	Additional Seed Godown	B9	Nos.	1250000	0	0.00	1	12.50	1	12.50	1	12.50	1	12.50	4	50.00
3	Construction of IAEC (383 Nos.) with vehicle shed and compound wall	B1, B3, B4 & B9	Nos.	25000000	0	0.00	4	1000.00	0	0.00	0	0.00	0	0.00	4	1000.00
4	Construction of Sub-AEC (498 Nos.)	B1, B2, B3, B4, B8, B9	Nos.	3000000	1	30.00	6	180.00	0	0.00	0	0.00	0	0.00	7	210.00
5	Construction of Uzhavar Maiyam/Farmers Hub	B11	Nos.	15000000	0	0.00	1	150.00	0	0.00	0	0.00	0	0.00	1	150.00
6	Establishment of Thrashing floor	B2 & B7	Nos.	500000	2	10.00	3	15.00	2	10.00	2	10.00	2	10.00	11	55.00
7	Dunnage	All Blocks except B7	Nos.	7500	10	0.75	110	8.25	110	8.25	101	7.58	110	8.25	290	33.08
8	Moisture meter	All Blocks except B7	Nos.	25000	0	0.00	11	2.75	0	0.00	0	0.00	0	0.00	7	2.75
9	Bag closure	All Blocks except B7	Nos.	10000	0	0.00	11	1.10	0	0.00	0	0.00	0	0.00	7	1.10
10	Electronic Platform balance	All Blocks except B7	Nos.	150000	0	0.00	11	16.50	0	0.00	0	0.00	0	0.00	7	16.50
11	Seed rack	All Blocks except B7	Nos.	30000	0	0.00	11	3.30	0	0.00	0	0.00	0	0.00	7	3.30
12	Tarpaulin	All Blocks except B7	Nos.	25000	0	0.00	11	2.75	1	0.25	10	2.50	0	0.00	14	5.50
13	Office furnishings and other amenities	All Blocks	Nos.	200000	0	0.00	12	24.00	0	0.00	0	0.00	0	0.00	12	24.00
14	Strengthening of training institute / nursery / FTC / KVK	All Blocks	Nos.	50000000	0	0.00	0	0.00	0	0.00	1	500.00	0	0.00	1	500.00
15	Infrastructure for empowerment of coconut nurseries	All Blocks	Nos.	5000000	0	0.00	1	50.00	0	0.00	0	0.00	0	0.00	1	50.00
	Grand total					**40.75**		**1491.15**		**56.00**		**557.58**		**55.75**		**2201.23**

Alwarthirunagiri - B1, Karungulam - B2, Kayathar - B3, Kovilpatti - B4, Ottapidaram - B5, Thoothukudi - B6, Pudur - B7, Sathankulam - B8, Srivaikundam - B9, Tirchendur - B10, Udangudi - B11, Vilathikulam - B12

4.1.11. Soil Health Management

It has been observed that the average productivity of major crops in Tamil Nadu is only about 60 percent of the potential yield. The reason may be due to decline in organic matter content of the soil of the State leading to low soil fertility. The availability of organic manures to farmers has become scanty and costly. The importance of FYM/Green manuring in maintaining the organic matter status of the soil has to be educated to the farmers. The total production of bio-fertilizers has to be stepped up to meet the growing demand. Similarly, crop based micronutrient mixtures need to be promoted. Soil amendments *viz.,* gypsum and lime have to be provided at a subsidized rate as a reclamation measure for the cultivable acid and alkali soils. Besides, efficient earthworm cultures should be provided for vermicompost unit by providing subsidy for establishment of vermicompost units with training in vermicompost.

Project Component:

- Reclamation of acid and alkali soils are covered in Alwarthirunagri and Pudur block.
- Production of enriched FYM and composting of farm waste through *Pluerotus* covered in Alwarthirunagri and Pudur blocks.
- Distribution of enriched press mud and blue green algae covered in Alwarthirunagri, Pudur block and Udankudi blocks.
- Establishment of permanent and HDPE vermicompost units are covered in Kayathar, Kovilpati, Pudur, Srivaikundam and Tirchendur blocks.
- Establishment of green manuring are covered in area of Alwarthirunagri, Karungulam, Srivaikundam, Udankudi and Tirchendur blocks.
- Adoptions of PGS certification through cluster approach are covered in area of Alwarthirunagri and Sathankulam.
- Strengthening of soil survey and land use organization units covered in all blocks.
- Distribution of soil health card covered in all blocks.

Budget:

Enhancing soil health by distributing enriched farm yard manure, micro-nutrient mixture, gypsum, bio-fertilizers, *etc.* is essential to maximize profitability. The overall budget to undertake the various interventions in Cuddalore district is ₹ 752.21 lakhs as shown in table 4.11

Expected Outcome:

Healthy soils are the foundation for profitable, productive and environmentally sound agricultural systems. In an agricultural context, it refers to the ability of the soil to sustain agricultural productivity and protect environmental resources. The proposed soil health management practices will improve soil health by increasing productivity and profitability immediately and into the future.

Implementing Agency:

The projects will be implemented by the Department of Agriculture.

Table 4.11. Budget requirement for Soil Health Management in Thoothukudi district

(₹ in lakhs)

Sl. No	Components	Unit	Unit Cost	Blocks covered	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
1	Permanent Vermi compost units	Cluster Nos.	50000	All Blocks except B2, B6 & B9	26	13.00	42	21.00	42	21.00	53	26.50	34	17.00	197	98.50
2	HDPE Vermi compost units	Kit Nos	12000	B3, B4, B7, B9, B10, B11 & B12	42	5.04	44	5.28	44	5.28	54	6.48	34	4.08	218	26.16
3	Reclamation of Alkali Soil	MT	50000	B1 & B7	10	5.00	15	7.50	17	8.50	18	9.00	20	10.00	80	40.00
4	Green Manuring	Nos	4000	B1, B2, B9, B10 & B11	243	9.72	299	11.96	351	14.04	402	16.08	478	19.12	1773	70.92
5	Adoption of PGS certification through cluster approach	Nos	1495000	B1 & B8	3	44.85	3	44.85	3	44.85	3	44.85	3	44.85	15	224.25
6	Production of Enriched FYM	MT	2500	B1 & B7	5	0.13	15.00	0.38	20.00	0.50	25.00	0.63	25.00	0.63	90	2.25
7	Composting of Farm Waste Through Pluerotus (Production and Distribution of Kits)	MT	200	B1, B7 & B11	31	0.06	31.00	0.06	31.00	0.06	31.00	0.06	31.00	0.06	155	0.31
8	Distribution of Soil Health Card	Ha	300	All Blocks	19821	59.46	18572	55.72	19821	59.46	18572	55.72	19821	59.46	96607	289.82
	Total					**137.26**		**146.74**		**153.70**		**159.31**		**155.20**		**752.21**

Alwarthirunagiri - B1, Karungulam - B2, Kayathar - B3, Kovilpatti - B4, Ottapidaram - B5, Thoothukudi - B6, Pudur - B7, Sathankulam - B8, Srivaikundam - B9, Tirchendur - B10, Udangudi - B11, Vilathikulam - B12

4.1.12. Rainfed Area Development

Rainfed areas account for nearly 57 per cent of the agricultural land in India. Rainfed areas if managed properly have the potential to contribute a larger share in the food grain production. These high potential rainfed areas provide us with opportunities for faster agricultural growth compared to irrigated areas that have reached a plateau In-fact the potential is such that there is more opportunity for faster agricultural growth here than in irrigated areas. With proper management, rainfed areas have the potential of contributing a larger share to food grain production. Increasing agricultural productivity of rainfed areas in a sustainable manner by adopting appropriate farming system based approaches in rainfed agriculture by creating sustained employment opportunities through improved on-farm technologies and cultivation practices Enhancement of farmer's income and livelihood support for reduction of poverty in rainfed areas.

Project components

- Stress Management in crops by the Application of Pink Pigmented Facultative Methylotrophs (PPFM spray)/ KCL Spray are covered in Pudur and Tirchendur blocks.
- Milch Animal (1 no) + 1 ha cropping system with inter crop & border plantation like castor/sesbania etc are in Kayathar, Kovilpati, Ottapidaram and Pudur blocks.
- Small ruminant (9+1) + 1 ha cropping system with inter crop & border plantation like castor/sesbania etc. Organic Mulching covered in Kovilpati and Pudur blocks.
- Creation of Farm pond in Pudur blocks.
- Promotion of Farmers club for Sustainable Dryland Agriculture were covered in Karungulam, Kayathar, Kovilpatti, Ottaipidaram, Pudur and Vilatikulam blocks.

Budget

It is proposed to incur 6085.93 lakhs over a period of five years with the finance facilities under the NADP and other sources was shown in table 4.12

Expected outcome

The expected outcome of the project will result in an increase in the production of the rainfed crops which will improve the income of the farmers

Implementing Agency

Department of Agriculture will implement the project and report the progress to the District-level officials.

Table 4.12. Budget requirement for Rainfed Area Development in Thoothukudi district

(₹ in Lakhs)

Sl. No	Components	Unit	Unit Cost	Blocks covered	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
1	Stress Management in crops by the Application of Pink Pigmented Facultative Methylotrophs (PPFM spray)/ Kcl Spray	Ha	400	B7 & B10	150	0.60	175	0.70	175	0.70	200	0.80	225	0.90	925	3.70
2	Milch Animal (1 no) + 1 ha Cropping system with inter crop & border plantation like castor/sesbania etc. @ Rs.27500/ as subsidy per Unit	Ha	55000	B3, B4, B5, B7 & B12	702	386.10	450	247.50	500	275.00	450	247.50	450	247.50	2552	1403.60
3	Small ruminant (9+1)+ 1 ha Cropping system with inter crop & border plantation like castor/sesbania etc. @ Rs.23500/ as subsidy per Unit	Ha	47000	B4 & B7	100	47.00	150	70.50	150	70.50	150	70.50	150	70.50	700	329.00
4	Creation of Farm pond	Nos.	75000	B7	50	37.50	50	37.50	50	37.50	50	37.50	50	37.50	250	187.50
5	Promotion of Farmers club for Sustainable Dryland Agriculture	Cluster	8494150	B2, B3, B4, B5, B7,B12	15	1274.12	31	2633.19	1	84.94	1	84.94	1	84.94	49	4162.13
	Grand total					**1745.32**		**2989.39**		**468.64**		**441.24**		**441.34**		**6085.93**

Alwarthirunagiri - B1, Karungulam - B2, Kayathar - B3, Kovilpatti - B4, Ottapidaram - B5, Thoothukudi - B6, Pudur - B7, Sathankulam - B8, Srivaikundam - B9, Tirchendur - B10, Udangudi - B11, Vilathikulam - B12

4.1.13. Integrated Pest Management (IPM)

Integrated Pest Management also known as integrated pest control is a broad based approach that integrates practices for economic control of pests. IPM aims to suppress pest populations below the economic injury level. IPM used in agriculture, horticulture, forestry, human habitations, preventive conservation and general pest control, including structural pest management. The principle is on control not eradication. IPM holds that wiping out an entire pest population is often impossible, and the attempt can be expensive and unsafe. IPM programmes first work to establish acceptable pest levels, called action thresholds, and apply controls if those thresholds are crossed. The IPM process starts with monitoring, which includes inspection and identification, followed by the establishment of economic injury levels.

Integrated pets management employ a variety of actions including cultural controls, including physical barriers, biological controls, including adding and conserving natural predators and enemies to the pest and finally chemical controls or pesticides.

Farmers Field Schools (FFS) is group based learning process that has been used by a governments to promote Integrated Pest Management (IPM). The FFS is a form of adult education, which evolved from the concept that farmers learn optimally from field observation and experimentation. It was developed to help farmers tailor their IPM practices to diverse and dynamic ecological conditions.

Interventions

1. Farmers Field Schools (FFS) covered in all blocks of Thoothukudi district.
2. Field days are conducted in Thoothukudi, Pudur, Tirchendur and Udankudi block.
3. Integrated Pest Management Villages covered in Thoothukudi and Udankudi block.
4. Establishment of Coconut Parasite Breeding Station in Thoothukudi block.
5. Establishment of Sugar canes Parasite Breeding Station are covered in in Thoothukudi block.
6. Establishment of Bio-pesticide production unit
7. IPM School in Karungulam, Ottapidaram, Pudukottai and Udankudi block.

Budget

It is proposed to incur ₹. 634.00 lakhs over a period of five years with the finance facilities under the NADP and other sources are shown in table 4.13

Expected outcome

The expected outcome of the project will result in an increase in the production of the crops which will improve the income of the farmers

Implementing Agency

Department of Agriculture will implement the project and report the progress to the District-level officials.

Table 4.13. Budget requirement for IPM in Thoothukudi district

(₹ in lakhs)

Sl. No	Components	Blocks covered	Unit	Unit Cost	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
1	Farmers Field Schools (FFS)	All Blocks	Nos.	20000	17	3.40	24	4.80	24	4.80	24	4.80	24	4.80	113	22.60
2	Field days	B6, B7, B10 ,B11	Nos.	20000	7	1.40	7	1.40	8	1.60	8	1.60	8	1.60	38	7.60
3	Integrated Pest Management Villages	B6 & B11	Nos.	100000	2	2.00	2	2.00	3	3.00	3	3.00	3	3.00	13	13.00
4	Establishment of Coconut Parasite Breeding Station	B6	Nos.	3500000	0	0.00	0	0.00	1	35.00	1	35.00	1	35.00	3	105.00
5	Establishment of Sugar cane Parasite Breeding Station	B6	Nos.	3500000	0	0.00	0	0.00	1	35.00	1	35.00	1	35.00	3	105.00
6	Establishment of Bio-pesticide production unit	B6	Nos.	12000000	0	0.00	0	0.00	1	120.00	1	120.00	1	120.00	3	360.00
7	IPM School	B2, B5, B6 & B11	Nos.	40000	9	3.60	10	4.00	11	4.40	11	4.40	11	4.40	52	20.80
	Grand total					**10.40**		**12.20**		**203.80**		**203.8**		**203.80**		**634.00**

Alwarthirunagiri - B1, Karungulam - B2, Kayathar - B3, Kovilpatti - B4, Ottapidaram - B5, Thoothukudi - B6, Pudur - B7, Sathankulam - B8, Srivaikundam - B9, Tirchendur - B10, Udangudi - B11, Vilathikulam - B12

4.1.14. Machineries

Farm Mechanization

Agricultural mechanization is the need of the hour to meet out the growing shortage of labour workforce in Agriculture. It has been identified as one of the critical inputs for increasing production in time. The labour intensive crops need high man power requirement, which is fast depleting and posing a big challenge to crop productivity. Agricultural labour wages are increasing at an alarming rate in Tamil Nadu resulting in shifting from labour intensive to mechanization intensive techniques. The farm machinery for land preparations, land development, seeding, planting, transplanting, weeding and intercultural operations, harvesting and threshing which are predominantly used in other parts of the country / other countries are proposed for introduction in the farmers field of Cuddalore district.

Project Component:

- Distribution of tractor, mini tractor and power tiller are covered in Ottapidaram, Pudur and Tirchendur blocks.
- Distributions of MB plough, rotavator, laser leveler are covered in karunkulam, baler in Alwarnagari block and paddy transplanter in Alwarnagari and Karugulam blocks.
- Distributions of tractor drawn seed cum fertilizer drill are covered in Alwarnagari block.
- Distribution of pump set in Alwarnagari and Srivaikundam block, mobile sprinklers, rain guns ottapidaram and vaikundam block and PVC Pipes to carry irrigation water from source to field
- Solar power pump system and solar light trap are covered in all blocks.
- Distribution of sprayers (power, hand and battery operated sprayer) are covered in all blocks except Alwarnagiri, Thoothukudi and Vilatikulam.
- Distribution of chaff cutter in alwarnagiri and kovilpati block, combine harvester, multi crop thrasher and Tarpaulins
- Distribution of weeder (manual, cono weeder and rotary power weeder) are covered in Alwarnagiri and Kovilpati block

Budget:

Agricultural mechanization programs are proposed to implement in a big way to increase the agricultural production and to popularize the agricultural machinery among the farmers of this district with a budget of ₹ 1794.70 lakhs.

Expected Outcome:

Distribution of farm machinery / implements to farmers will increase the farm power. All the proposed agricultural machinery / implements will be put into use by the farmers. The acute agricultural labour scarcity will be reduced. The benefit of agricultural mechanization is to be extended to all categories of farmers with due consideration to small, marginal, scheduled caste, scheduled tribes and women farmers.

Implementing Agency:

The projects will be implemented by the Department of Agriculture.

Table 4.14. Budget requirement for Machineries in Thoothukudi district

(₹ in lakhs)

Sl. No	Components	Blocks covered	Unit	Unit Cost	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
	Farm Mechanization															
1	Solar light trap	All Blocks	No.	4000	618	24.72	617	24.68	637	25.48	667	26.68	672	26.88	3211	128.44
2	Power operated sprayer	All Blocks except B1, B3, B6 & B12	Nos.	8000	63	5.04	56	4.48	61	4.88	63	5.04	65	5.20	308	24.64
3	Hand operated sprayer	All Blocks except B1, B3, B6 & B12	Nos.	1500	150	2.25	215	3.23	217	3.26	225	3.38	235	3.53	1042	15.63
4	Battery operated sprayer	B2, B5, B7, B8, B9, B10 & B11	Nos.	4000	50	2.00	61	2.44	63	2.52	66	2.64	71	2.84	311	12.44
5	Distributiom of Tarpaulins	B2, B4, B5, B6, B7, B9, B10 & B12	Nos	8000	240	19.20	305	24.40	305	24.40	310	24.80	315	25.20	1475	118.00
6	Distribution of Rotavator	B2, B3, B4, B5, B7, B9 & B10	Nos	80000	35	28.00	33	26.40	33	26.40	33	26.40	33	26.40	167	133.60
7	Distribution of Powertiller	B5, B7 & B10	Nos	150000	6	22.50	6	22.50	6	22.50	5	21.00	5	21.00	28	109.50
8	Distribution of Powertiller	B1, B2, B6, B8, B9 & B12	Nos	150000	31	46.50	47	70.50	54	81.00	61	91.50	68	102.00	261	391.50
9	Distribution of Laser leveller	B2	Nos	380000	2	7.60	2	7.60	2	7.60	2	7.60	2	7.60	10	38.00
10	Distribution of Baler	B1	Nos	350000	0	0.00	3	10.50	3	10.50	3	10.50	3	10.50	12	42.00
11	Distribution of Mini Tractor	B1 & B4	Nos	300000	0	0.00	3	9.00	3	9.00	4	12.00	4	12.00	14	42.00
12	Distribution of Paddy transplanter	B1 & B2	Nos	1200000	1	12.00	2	24.00	2	24.00	2	24.00	2	24.00	9	108.00
13	Distribution of chaff cutter	B1 & B4	Nos	25000	0	0.00	3	0.75	3	0.75	3	0.75	3	0.75	12	3.00
14	Distribution of Rotary Power weeder	B1	Nos	70000	0	0.00	1	0.70	1	0.70	1	0.70	1	0.70	4	2.80
15	PVC Pipes to carry Irrigation water from source to field	All Blocks except B2, B3, B6, B11 & B12	Unit	40000	87	34.30	105	41.50	115	45.50	122	48.30	130	51.50	559	221.10

Sl. No	Components	Blocks covered	Unit	Unit Cost	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
16	Distribution of Mobile Sprinklers	B1, B2, B3, B8, B10 & B11	Ha	30000	121	36.30	128	38.40	134	40.20	139	41.70	143	42.90	665	199.50
17	Distribution of Rain guns	B4 & B8	Ha	40000	0	0.00	40	16.00	42	16.80	48	19.20	50	20.00	180	72.00
18	Distribution of Tractor Drawn Seed cum Fertilizer Drill	B1	Nos	70000	0	0.00	1	0.70	1	0.70	1	0.70	1	0.70	4	2.80
19	Distribution of Manual Weeder	B1 & B2	Nos	2000	2	0.04	4	0.08	6	0.12	8	0.16	10	0.20	30	0.60
20	Distribution of Power Weeder	B1	Nos	65000	0	0.00	2	1.30	4	2.60	4	2.60	5	3.25	15	9.75
21	Solar power pump system	B1, B5 & B9	Nos	600000	2	12.00	5	30.00	3	18.00	3	18.00	3	18.00	16	96.00
22	Distribution Pumpset	B1, B7 & B9	Nos	30000	5	1.50	19	5.70	17	5.10	18	5.40	19	5.70	78	23.40
	Grand total					**253.95**		**364.86**		**372.01**		**393.05**		**410.85**		**1794.70**

Alwarthirunagiri - B1, Karungulam - B2, Kayathar - B3, Kovilpatti - B4, Ottapidaram - B5, Thoothukudi - B6, Pudur - B7, Sathankulam - B8, Srivaikundam - B9, Tirchendur - B10, Udangudi - B11, Vilathikulam - B12

4.1.15. Information Technology in Agriculture

Agriculture is a major sector which is vital for the survival of modern man. The produce from agriculture drives trade from one country to another, brings income for farmers, makes productive use of otherwise idle land, and brings food on the table. It is such an important part of everyone's daily life, although it may not be seen as a direct factor since the produce goes a long way before reaching the hands of everyone who benefits from it. Because of its importance to society, it's must to evolve with the times and adjust to meet the needs of modern people. By adapting and making use of IT to help improve agricultural progress, everyone benefits from the union of these sectors.

Role of IT in Agriculture

In the context of agriculture, the potential of information technology (IT) can be assessed broadly under two heads: (a) as a tool for direct contribution to agricultural productivity and (b) as an indirect tool for empowering farmers to take informed and quality decisions which will have positive impact on the way agriculture and allied activities are conducted.The indirect benefits of IT in empowering farmer are significant and remain to be exploited. The farmer urgently requires timely and reliable sources of information inputs for taking decisions. At present, the farmer depends on trickling down of decision inputs from conventional sources which are slow and unreliable. The changing environment faced by farmers makes information not merely useful, but necessary to remain competitive.

Components include input devices, output devices, processors, storage devices, software, networking devices, transmission media and other accessories are covered in all blocks of thoothukudi districts.

Budget

It is proposed to incur ₹ 144.69 lakhs over a period of five years with the finance facilities under the NADP and other sources are shown in table 4.15.

Expected outcome

The expected outcome of the project will result in an increase in the adoption of technologies for production of the crops which will improve the income of the farmers

Implementing Agency

Department of Agriculture will implement the project and report the progress to the District-level officials.

Table 4.15. Budget requirement for IT in Thoothukudi district

(₹ in lakhs)

Sl. No	Components	Blocks covered	Unit	Unit Cost	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
1	Procurement of Hardware for replacement of old hardware	All Blocks	Nos	50000	0	0.00	12	6.00	0	0.00	0	0.00	12	6.00	24	12.00
2	Connectivity Charges	All Blocks	Nos	11000	0	0.00	12	1.32	0	0.00	0	0.00	12	1.32	24	2.64
3	Printer cum Scanner	All Blocks	Nos	20000	0	0.00	12	2.40	0	0.00	0	0.00	12	2.40	24	4.80
4	UPS and electrical accessories	All Blocks	Nos	35000	0	0.00	12	4.20	0	0.00	0	0.00	12	4.20	24	8.40
5	Xerox machine	All Blocks	Nos	75000	0	0.00	12	9.00	0	0.00	0	0.00	12	9.00	24	18.00
6	Laptop/Desktop	All Blocks	Nos	50000	0	0.00	12	6.00	0	0.00	0	0.00	12	6.00	24	12.00
7	Anti -virus software	All Blocks	Nos	2500	0	0.00	12	0.30	0	0.00	0	0.00	12	0.30	24	0.60
8	Television	All Blocks	Nos	100000	0	0.00	12	12.00	0	0.00	0	0.00	12	12.00	24	24.00
9	Colour printer	All Blocks	Nos	15000	0	0.00	12	1.80	0	0.00	0	0.00	12	1.80	24	3.60
10	4G Internet - Dongle	All Blocks	Nos	2500	0	0.00	12	0.30	0	0.00	0	0.00	12	0.30	24	0.60
11	Equipments for Documentation															
12	Handycam	All Blocks	Nos	30000	0	0.00	12	3.60	0	0.00	0	0.00	12	3.60	24	7.20
13	Camera	All Blocks	Nos	25000	0	0.00	12	3.00	0	0.00	0	0.00	12	3.00	24	6.00
14	GPS instrument	All Blocks	Nos	20000	0	0.00	12	2.40	0	0.00	0	0.00	12	2.40	24	4.80
15	Android mobile	All Blocks	Nos	15000	0	0.00	12	1.80	0	0.00	0	0.00	12	1.80	24	3.60
16	External Hard disk	All Blocks	Nos	5000	0	0.00	12	0.60	0	0.00	0	0.00	12	0.60	24	1.20
17	LCD projector	All Blocks	Nos	75000	0	0.00	12	9.00	0	0.00	0	0.00	12	9.00	24	18.00
18	Pico Projector	All Blocks	Nos	35000	0	0.00	12	4.20	0	0.00	0	0.00	11	3.85	23	8.05
19	Air conditioner for computer room	All Blocks	Nos	40000	0	0.00	12	4.80	0	0.00	0	0.00	11	4.40	23	9.20
	Grand total					**0.00**		**72.72**		**0.00**		**0.00**		**71.97**		**144.69**

Agriculture research infrastructure and development in Thoothukudi district

Production of quality planting material of one or more specified crops by adopting good nursery management practices. Nursery premise only where sale of specified quality planting material of recognized source are being carried out by creating necessary infrastructure facilities and proper record keeping. Infrastructure facilities like establishment of mist chambers, shade net houses, environment controlled chambers etc. are essential for production and supply of quality planting materials to the farmers and urban folks. Technology changes very rapidly and therefore, the facilities in every technical Institute become obsolete vary fast. Therefore, it is always necessary to support technical institutes regularly by providing assistance to upgrade infrastructure so as to excel in research and innovations are covered in kurungulam block.

The main objective of bio-control laboratories is to control pests/disease through the use of natural predators and biofertilizers instead of using chemical pesticides. To encourage the use of bio fertilizers / bio pesticide, Govt. of Tamil Nadu has established few bio-control laboratories. These labs produce biofertilizers like Azospirillum, Phosphobacteria and VAM and bio-pesticides viz.*Trichoderma, Pseudomonas*, *Beauveria* and *Verticilium* in their laboratories and supplied to the farmers of various regions. The proposed intervention is also focused on establishment of bio control laboratories at stations for research and development. Microbial inoculants like Trichoderma, Pseudomonas (PGPR), Bacillus spp, nitrogen fixing, phosphate solubilizing and cellulolytic organisms have been well studied for their potential use in crop production. With the increasing demand for quality spawn, and quality bioinoculants, it is very much imperative to set up “Large Scale Pilot Plant Facilities for Automated Bioinoculants and Mushroom Spawn Production”. In toto the project proposal aims to accomplish large scale supply quality bioinoculants and mushroom spawn to promote and encourage farmers of Tamil Nadu on organic sustainable farming and crop residue management through mushroom growing and compost production. The outcome of the project will be a boon to revolutionize primary and secondary agriculture in Tamil Nadu towards the production of protein rich food, quality feed and bioinoculants enriched compost simply, by way of crop residue management in agricultural research are covered in kurungulam block.

Animal Husbandry and Agriculture are the twin occupations, which from time memorial have played a significant role in improving the rural economy. Livestock sector is directly linked to the livelihoods of more than 70% of rural households. Cattle wealth is still considered as an index of wealth among rural community. Livestock rearing provides

meaningful occupation both full time and subsidiary at the location itself and provides assured income and ensures better utilization of human resources. Poultry development in the country has shown steady progress over the years, primarily due to research and development schemes of Government as well as effective marketing & management by organized private sector. Hence the setting up of animal husbandry and poultry unit is very much essential are covered in kurungulam block

The limited processing facility undermines productivity and limits income of the farmers, as acid lime production and market price fluctuates over different seasons. In times of over production by means of value addition the post-harvest losses can be minimized. The storage cum processing units strengthens citrus industry and boost farmers earning in southern districts. Establishment of Model acid lime processing unit will facilitate better access to modern technologies and speedup dissemination rates. The farmers will also be able to generate assured income through value addition. Training and demonstrations on precision water and nutrient usage, INM, IPM, use of natural plant enemies, cultivation under protected structures etc. imparts confidence with in the farmers in agriculture and make them to adopt to harvest bumper crop and to get triple the income. In this regard setting up of training institute will be off immense use in changing the economic and social status of the farmers, skilled workers, rural women and self-entrepreneurship development among the stake holders are covered in kurungulam block.

Storage is an important marketing function, which involves holding and preserving goods from the time they are produced until they are needed for consumption. The storage of goods, therefore, from the time of production to the time of consumption, ensures a continuous flow of goods in the market. Storage protects the quality of perishable and semi-perishable products from deterioration. Some of the goods e.g., woolen garments, have a seasonal demand. To cope with this demand, production on a continuous basis and storage become necessary. It helps in the stabilization of prices by adjusting demand and supply. A storage godown is necessary for some period for performance of other marketing functions are covered in kovilpati block.

These problems all necessitate the need for making them aware of good farming practices from research infrastructure which may provide better infrastructure facilities and higher agricultural production by adopting the following research infrastructure facilities so

they can be getting a better knowledge on crops for getting higher agricultural production at Thoothukudi district.

Project components

- Establishment of Department laboratories are covered in Karungulam block.
- Establishment of Biocontrol laboratory are covered in Karungulam block.
- Establishment of Farmers Trainees Hostel are covered in Karungulam block.
- Establishment of Model Lime Processing Unit are covered in Karungulam block.
- Creation of Advanced grain quality analysis laboratory are covered in Karungulam block.
- Establishment of nursery with sales outlet are covered in Karungulam block.
- Developments of animal husbandry unit are covered in Karungulam block.
- Developments of poultry unit are covered in Karungulam block.
- Creation of automated spawn production unit were covered in Karungulam block.
- Establishment of Centre for Plant molecular biological laboratory are covered in Kovilpati block.
- Strengthening of glass house and polyhouse are covered in Karungulam block.
- Construction of storage godowns and seed processing unit are covered in Kovilpati block.

Budget

The budget requirement for the above research and development activities is estimated at Rs.**966.00** lakhs over a period of five years

Expected outcome

The implementation of the above project will result in better research activities and trainings on latest technologies which in turn results in better infrastructure facilities and higher agricultural production.

Implementing agency

Tamil Nadu Agricultural University will be implementing the project.

Table 4.16 Budget for Agricultural Research infrastructure and Development in Thoothukudi district

Sl. No.	Interventions	Blocks Covered	Unit Cost	2017-2018		2018-2019		2019-2020		2020-2021		2021-2022		Total	
				Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.
I	**Research Infrastructure**														
1	Establishment of Department laboratories	Karungulam	10	2	20.00	1	10	2	20	1	10	2	20	**8**	**80.00**
2	Establishment of Biocontrol laboratory	Karungulam	80	0	0.00	1	80	0	0	0	0	0	0	**1**	**80.00**
3	Establishment of Farmers Trainees Hostel	Karungulam	100	0	0.00	0	0	1	100	0	0	0	0	**1**	**100.00**
4	Establishment of Model Lime Processing Unit	Karungulam	100	0	0.00	1	100	0	0	0	0	0	0	**1**	**100.00**
5	Creation of Advanced grain quality analysis laboratory	Karungulam	50	0	0.00	1	50	0	0	0	0	0	0	**1**	**50.00**
6	Establishment of nursery with sales outlet	Karungulam	25	1	25.00	0	0	0	0	0	0	0	0	**1**	**25.00**
7	Development of animal husbandry unit	Karungulam	10	1	10.00	0	0	0	0	0	0	0	0	**1**	**10.00**
8	Development of poultry unit	Karungulam	1	1	1.00	0	0	0	0	0	0	0	0	**1**	**1.00**
9	Creation of automated spawn production unit	Karungulam	20	0	0.00	1	20	0	0	0	0	0	0	**1**	**20.00**
10	Establishment of Centre for Plant molecular biological laboratory	Karungulam	200	1	200.00	0	0	0	0	0	0	0	0	**1**	**200.00**
11	Strengthening of glass house and polyhouse	Karungulam	10	1	10.00	1	10	0	0	0	0	0	0	**2**	**20.00**

Sl. No.	Interventions	Blocks Covered	Unit Cost	2017-2018		2018-2019		2019-2020		2020-2021		2021-2022		Total	
				Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.
12	Establishment of Advanced grain qualtiy analysis laboratory	Kovilpatti	50	0	0.00	1	50	0	0	0	0	0	0	**1**	**50.00**
13	Construction of storage godowns and seed processing unit	Kovilpatti	10	1	10.00	0	0	0	0	0	0	0	0	**1**	**10.00**
14	Production of water soluble fertilizers	Karungulam	170	1	170.00	0	0	0	0	0	0	0	0	**1**	**170.00**
15	Fruit and Vegetable processing unit	Karungulam	50	1	50.00	0	0	0	0	0	0	0	0	**1**	**50.00**
	Total				**496.00**		**320.00**		**120.00**		**10.00**		**20.00**		**966.00**

Table 4.17. Budget requirement of implementation of interventions for major crops

(₹ in lakhs)

Sl. No	Components	2017-18	2018-19	2019-20	2020-21	2021-22	Total
1	Paddy	41.30	538.68	555.51	587.29	610.83	2333.61
2	Millet	56.33	302.31	307.37	312.97	366.06	1345.04
3	Pulses	611.07	1242.82	1406.61	1430.15	1474.63	6165.28
4	Oilseeds	27.36	65.90	73.49	84.90	95.61	347.26
5	Oilpalm	27.05	10.60	8.30	8.10	8.10	62.15
6	Cotton	30.58	56.11	57.16	57.68	58.67	260.20
7	Sugarcane	26.95	23.96	49.94	35.19	55.41	191.45
8	Coconut	201.00	172.90	211.36	236.44	282.45	1104.15
9	Training	50.48	50.48	50.58	50.48	50.48	252.50
10	Infrastructure	40.75	1491.15	56.00	557.58	55.75	2201.23
11	Soil Health Management	137.26	146.74	153.70	159.31	155.20	752.21
12	Rainfed Area Development	1745.32	2989.39	468.64	441.24	441.34	6085.93
13	Integrated Pest Management	10.40	12.20	203.80	203.80	203.80	634.00
14	Farm Mechanization	253.95	364.86	372.01	393.05	410.85	1794.72
15	Strengthening of State Seed Farm	0.00	0.00	0.00	0.00	0.00	0.00
16	Agriculture Information Technology	0.00	72.72	0.00	0.00	71.97	144.69
	Grand total	**3259.80**	**7540.82**	**3974.47**	**4558.18**	**4341.15**	**23674.42**

4.2 Horticulture sector

Horticulture plays a vital role in the food and nutritional security of the people as well as in earning foreign exchange through export of raw and value added horticultural crops. The farmers are ready to go in for the cultivation of horticultural crops which prove remunerative. The challenge lies in taking the technologies to 90 per cent of farmers who are small and marginal farmers. In all, horticulture crops are grown in 10.01 lakh hectares, of which vegetables, spices, plantation crops, flowers and medicinal plants are the major crops cultivated in the State. Totally, 86 horticultural crops are grown in the State which clearly indicates the crop diversity and also the possibility of augmenting the income of farmers. The major strategies suggested are as follows:

Area expansion of Horticultural crops

a. Fruit Crops

Today's changing food pattern enhances the area expansion under fruits. The preferable choices of fruits are Mango, Apple, Banana, Grapes, Orange, Guava, Pomegranate, Sapota etc. Fruits are rich in fiber which is very essential for the smooth movement of the digestive system. There are some fruits that give body energy as they contain carbohydrates which are the main source of energy. Carbohydrates in fruits are mainly sugar which actually breaks down easily and make a quick source of energy. They also contain minerals, vitamins and nutrients that are useful for a healthy life. Considering the importance of fruits, the productivity can be increased by promotion of cultivation of fruit crops in the potential areas covered in all blocks except alwarnagari, thoothukudi, tirchendur and udankudi block.

b. Vegetable crops

Vegetables are the store houses of most of the vitamins and minerals and also proteins. In order to ensure continuous supply of fresh vegetables to the burgeoning urban markets, it is absolutely necessary to create forward linkages from rural to urban areas. This will also ensure assured income to farmers in the rural areas adjoining the cities. Cultivation of vegetables, formation of farmer clusters, formation of farmers society, collection centers, reefer vans, retail outlets, mobile stores are the components to be promoted for increasing the productivity and marketing of vegetables covered in all blocks except alwarnagari, pudur,srivaikundam, tirchendur and udankudi block.

c. Flower crops

The major flowers grown are Gundumalli, Mullai, Rose, Crossandra, Chrysanthemum, Marigold, Tuberose, Arali, Jathimalli etc. Floriculture activity has evolved as a viable and profitable alternative, with a potential to generate remunerative self-employment among small & marginal farmers. The flower crops require lots of manpower for picking flowers and perform other operations, hence providing opportunity to marginal and small farmers for generating more income, employment and promote greater involvement of women work force. Keeping this in mind, the promotion area of cultivation of traditional and cut flowers are planned for different flower crops covered in karungulam, kayathar and ottapidaram block.

d. Spice crops

Spice crops play a unique role in India's economy by improving the income of the rural people. Cultivation of spices is labor intensive so it can generate lot of employment opportunities for the rural population. The demand of Indian spice is very much in other countries. Hence production of spices has very much scope to meet that demand by huge production.

e. Plantation crops

Plantation crops are high value commercial crops of greater economic importance and play a vital role in our Indian economy. These crops help to conserve the soil and ecosystem. The crops include tea, coffee, rubber, cocoa, coconut, arecanut, oil palm, palmyrah, cashew, cinchona etc. So the promotion of cultivation of plantation crops in the potential districts will increase the economy of the farmer and also Indian economy.

Improving Infrastructural facilities for production

To increase the income of the horticultural farmers, support for the establishment of pandals, trellies, staking and propping polygreen houses, (tubular structure) have to be provided. Vegetables like bitter gourd, snake gourd, ribbed gourd, pandal avarai, pole beans, tomato, gherkin, cucumber, squash and in fruits grapes, musk melons and in spices pepper etc could be cultivated under pandal cultivation. Similarly, crops like peas, musk melon, pole beans, tomatoes, ivy gourd could be raised in trellies. High value vegetables like capsicum, beans and flowers like carnation, roses etc could be raised in poly houses.

Maintenance of Plantation

The existing fruit trees have to be maintained properly until they attain fruit bearing stage and thereafter up to economically profitable bearing stage. This calls for proper maintenance of fruit trees with appropriate intercultural operations periodically. Regular maintenance of orchards / fruit trees would enhance the production / productivity as well.

Area expansion by Precision Farming Technology

By providing inputs like water soluble fertilizers, hybrid / high yielding vegetable seeds and plant protection chemicals, the area under annual crops like vegetables, flowers, spices, medicinal plants and one year long season crops like banana, tapioca, annual moringa and turmeric could be raised under precision farming technology.

Area expansion by high density planting

By adopting high density planting in mango, guava and sapota, the area under fruit trees could be increased. This includes supply of pedigree planting materials, integrated nutrient management and integrated pest management.

Area expansion by Normal Planting

Besides precision farming and high density planting, the area could be increased by normal planting as well by using pedigree planting materials in fruits, spices, flowers and plantation crops. Similarly, by extending support for the planting materials of high value vegetables, the protected cultivation of vegetable area could also be increased. Likewise, cultivation of cut flowers and filler foliage also need to be encouraged.

Protected cultivation

Precision Farming through Hi tech cultivation Practices It is proposed to plan for increasing the production of crops by adopting advanced technology like high tech cultivation practices which includes high density planting, use of quality planting materials, tissue culture planting materials, canopy management, micro irrigation fertigation, mulching, use of bunch sleeves for banana, protected cultivation, shade net nursery and mechanization in horticulture crop cultivation by popularizing the same among the growers to enhance productivity. It is proposed to adopt high density planting in mango, guava and sapota in select districts of the State by providing subsidy.

Rejuvenation of Old Orchards – Mango and Guava

In general, 40-45 years old mango trees exhibit decline in fruit yield because of dense and overcrowded canopy. The trees do not get proper sunlight resulting in decreased production of shoots. New emerging shoots are weak and are unsuitable for flowering and fruiting. The population of insects and pests builds up and the incidence of diseases increases in such orchards. These unproductive trees can be converted into productive ones by pruning with the techniques developed. Similarly, a procedure to rejuvenate and restore the production potential of old unproductive and wilt affected guava orchards has been developed, which employs pruning of branches at different periodicity and at different severities. Crowding and encroachment of guava trees with subsequent inefficient light utilization is an obvious problem with older orchards, if trees are not well managed. The internal bearing capacity of guava trees also decreases with time, due to overshadowing of internal bearing wood covered in all blocks except Thoothukudi and Otapidaram block..

Organic farming

Organic farming is an alternative agricultural system which originated early in the 20th Century in reaction to rapidly changing farming practices. It relies on fertilizers of organic origin such as compost, manure, green manure, and bone meal and places emphasis on techniques such as crop rotation, companion planting. Biological pest control, mixed cropping and fostering of insect predators are encouraged. Since 1990, the market for organic food and other products has grown rapidly, reaching $63 billion worldwide in 2012. This demand has driven a similar increase in organically managed farmland that grew from 2001 to 2011 at a compounding rate of 8.9 per cent per annum. As of 2011, approximately 3.70 lakh hectares worldwide were farmed organically, representing approximately 0.9 per cent of total world farmland. Organic farming encourages crop diversity. The science of agro ecology has revealed the benefits of polyculture (multiple crops in the same space), which is often employed in organic farming. Planting a variety of vegetable crops supports a wider range of beneficial insects, soil microorganisms, and other factors that add up to overall farm health. Crop diversity helps environments thrive and protects species from going extinct. The profitability of organic agriculture can be attributed to a number of factors. First, organic farmers do not rely on synthetic fertilizer and pesticide inputs, which can be costly. In addition, organic foods currently enjoy a price premium over conventionally produced foods, meaning that organic farmers can often get more for their yield.

The price premium for organic food is an important factor in the economic viability of organic farming. Organic agriculture can contribute to ecologically sustainable, socio-economic development, especially in poorer countries. The application of organic principles enables employment of local resources (e.g., local seed varieties, manure, etc.) and therefore cost-effectiveness. Local and international markets for organic products show tremendous growth prospects and offer creative producers and exporter's excellent opportunities to improve their income and living conditions covered in all blocks except thoothukudi block

Post-Harvest Management

In agriculture, postharvest handling is the stage of crop production immediately following harvest, including cooling, cleaning, sorting and packing. Postharvest treatment largely determines final quality, whether a crop is sold for fresh consumption, or used as an ingredient in a processed food product. The most important goals of post-harvest handling is to avoid moisture loss and slow down undesirable chemical changes, and avoiding physical damage such as bruising, to delay spoilage. Sanitation is also an important factor, to reduce the possibility of pathogens that could be carried by fresh produce, for example, as residue from contaminated washing water covered pudur and vilatikulam block.

Marketing Interventions

Interventions to build the marketing system are essential such that marketing expenses should be shifted as an expense towards an investment. It's important that interactions between farmers and market intermediaries should match the image of marketing portrays.

Capacity building

Capacity building of Horticultural Officers and Farmers

In service training of horticultural officers regularly would help them to update the modern technologies in production, marketing and value addition of horticultural crops including organic farming. Similarly, exposure visits to farmers to nearby districts / States and even foreign countries would help them aware and adopt new innovative technologies covered in all blocks.

Bee Keeping

Production of apiary honey in the country reached 10,000 tons, valued at about Rs.300 million. Bee-Keeping Industry is one of the important activities. The Government provides

financial support to this Industry by way of providing grant for supply of bee-hives to the Tribal on hill areas, Scheduled Castes /Scheduled Tribes under Western Ghats Development Programmes, Hill Area Development Programme and Integrated Tribal Development Programme. The income earned by the farmers through bee-keeping activities is an additional income to their agriculture income. Honey industry in the country can well become a major foreign exchange earner if international standards are met. Beekeeping is an age-old tradition in India but it is considered a no-investment profit giving venture in most areas. Of late, it has been recognized that it has the potential to develop as a prime agri-horticultural and forest-based industry. Honey production is a lucrative business and it generates employment.

Apiary honey is produced in bee hives and is harvested by extraction in honey extractors. Other types of beekeeping equipment like queen excluder, smoker, hive tool, pollen trap and honey processing plant are also used. Indian honey has a good export market. With the use of modern collection, storage, beekeeping equipment, honey processing plants and bottling technologies, the potential export market can be tapped covered in all blocks.

Mechanization in cultivation of horticultural crops

Mechanization encourages large scale production and improves the quality of farm produce. It ensures reduction of drudgery associated with variety of farm operations and also encourages the utilization of input and thereby harnessing the potential of available resources. Provision of power operated machineries and tools including power operated saw and plant protection equipments, power machines with rotavator / equipment, power machines including accessories and equipment would strengthen the infrastructural facilities covered in all blocks except kayathar blocks.

Micro Irrigation, Water harvesting and Management

With increasing demand on water from various sectors, the availability of water is under severe stress. Agriculture sector is the largest use of water. While irrigation projects (Major and medium) have contributed to the development of water resources, conventional methods of irrigation are inefficient and lead to wastage of water. It has been recognized that the use of modern irrigation methods like drip and sprinkler irrigation are the ways for the efficient use of surface as well as ground water resources.

Majority of fruit trees / orchards are under rainfed cultivation. It is advisable to bring a minimum percentage of the area under irrigation by providing and strengthening the water

harvesting system. This includes provision of drip irrigation facilities wherever possible, recharge of defunct bore wells, provision of pipes and protected distribution system, provision of water lifting devices, Insitu water conservation and the like covered in all blocks

Special Interventions

Production Enhancement through Precision Farming

Farmers have experienced fruitful results of technology especially during the past five years. Hence further increase in the production of horticultural crops would be possible both by increasing area and productivity by adopting advanced technologies like precision farming, high density planting, protected cultivation, shade net nursery, integrated pest management and integrated nutrient management. Besides increasing infrastructure and mechanization facilities, productivity enhancement is considered by area expansion and resorting to high tech cultivation practices. Annual crops like vegetables, flowers, spices, medicinal plants and one year long season crops like banana, tapioca, turmeric and annual moringa could be considered for expansion by precision farming technology and providing assistance for inputs like water soluble fertilizers, hybrid/ high yielding vegetable seeds, plant protection chemicals etc., with subsidy.

Pandal / Trellis cultivation, Propping / Support / Staking

Pandal vegetables being short duration crops fit very well in the cropping system by offering viable option to the growers to get increased income per unit area. However, the cultivation of vegetables is too constrained due to high initial investment cost. With the objective of enhancing area under pandal vegetables and encouraging farmers to realize increased income, this project is proposed by popularizing high yielding/hybrid seed materials and dissemination of improved method of cultivation to farmers. It is proposed to cover at least 500 hectares in crops like bitter gourd, ribbed gourd, snake gourd, pandal beans etc.

Banana Bunch Sleeve

'Bunch care techniques' are to be followed in banana cultivation to achieve the best quality. Transparent polyethylene sleeves are recommended to cover the bunch immediately after opening of the last hand. Using of opaque polythene covers / sleeves gauge (during winter) and paper bags (to avoid chilling injury at frost conditions and sun scrotch). The bunch will be free from insect bites, fungi, bacteria attacks and physical injuries. The cover will also improve bunch appeal and maturity of bunch will be advanced by 7 to 10 days.

Agro Ecosystem Analysis (AESA) based IPM

The IPM has been evolving over the decades to address the deleterious impacts of synthetic chemical pesticides on environment ultimately affecting the interests of the farmers. The economic threshold level (ETL) was the basis for several decades but in modern IPM (FAO 2002) emphasis is given to AESA where farmers take decisions based on larger range of field observations. Decision making in pest management requires a thorough analysis of the agro-ecosystem. Farmer has to learn how to observe the crop, how to analyze the field situation and how to make proper decisions for their crop management. This process is called the AESA. In AESA based IPM emphasis is given to natural enemies, plant compensation ability, abiotic factors and P: D ratio.

Control of coconut Red Palm weevil

Coconut is a perennial crop and longevity of the tree is about 50 to 70 years. The red palm weevil is a fatal enemy and less than 20 years coconut palm succumbs to severe damage when infected. Hence it is highly necessary to control the attack of red palm weevil pest on war footing. It is programmed to distribute 50, 000 traps of ferrolure of five traps per ha for 1.00 lakh hectare with subsides assistance of 50 per cent. The total cost for one hectare of Rs. 325/ferrolure comes to Rs.3, 250. Hence, an assistance of Rs. 1600/ha is proposed for five ferrolure per ha.

Promotion of Roof top Garden / Potager garden

The traditional kitchen garden, also known as a potager is a space separate from the rest of the residential garden i.e. the ornamental plants and lawn areas. Most vegetable gardens are still miniature versions of old family farm plots, but the kitchen garden is different not only in its history, but also its design. The kitchen garden may serve as the central feature of an ornamental, all-season landscape, or it may be little more than a humble vegetable plot. It is a source of herbs, vegetables and fruits, but it is often also a structured garden space with a design based on repetitive geometric patterns. The kitchen garden has year-round visual appeal and can incorporate permanent perennials or woody shrub plantings around (or among) the annuals.

There are many types of vegetable gardens. The potager, a garden where vegetables, herbs and flowers are grown together, has become more popular than the more traditional rows or blocks.

Some popular culinary herbs in temperate climates are to a large extent still the same as in the medieval period. Herbs often have multiple uses. For example, mint may be used for cooking, tea, and pest control covered in all blocks.

Perimetro Vegetable Cluster Development Programme

Since production of vegetables is not in accordance with the market demand and the productivity of many vegetables is less than the potential yield, farmers are to be motivated to plan for cultivation of vegetables based on market demand. Market led production of vegetables need to be taken up to ensure continuous supply of vegetables to the market andthe grower to get increased return out of sale of produce. Hence, it is necessary to go in for the productivity enhancement by advanced technologies. The project involves vegetable

Cultivation under protected condition, post-harvest management, collection centres, retail outlets and training to the growers. The vegetable produced in the project area will be immediately transported to the pack house where grading, sorting and standard packing will be done. Further to narrow down the supply chain, open retail outlets and mobile stores are proposed.

Establishing Centre of Excellence for different crops

Centre of Excellence for Horticulture crops like fruits, vegetables and flowers are aimed at designing, manufacturing and installation of State of the art facilities be it greenhouse technology, environmental control systems, tissue culture labs, crop production modules specializes in developing Centre of Excellence for fruits, vegetables and flowers in different states of India.

Computerization and Governance

As per the Stated policy under the scheme of E-governance and computerization of the various Development Departments, desktop computers and associated equipments had been contemplated. In order to ensure effective implementation of E-Governance, computer equipments (such as laptops, personal computers, Tablets etc) are essential covered in all blocks

Research on Crop Diversification

Crop Diversification refers to a shift from the regional dominance of one crop to regional production of a number of crops, to meet ever increasing demand of cereals, pulses, vegetables, fruits, oilseeds, fibres, fodder, grasses etc. It aims to improve soil health and to maintain dynamic

equilibrium of the agro-ecosystem. In the instant case, crop diversification is intended to promote technological innovations for sustainable agriculture and enable farmers to choose crop alternatives for increased productivity and income.

Special Development Programme – Onion

Onion Storage Structures

India is one of the largest producers of onion in the world. It is one of the most important vegetable crops of our country and forms a part of daily diet in almost all households. In Tamil Nadu onion was grown in an area of about 35,000 ha with a production of 3,80,000 tons. Most of the farmers bring onion directly to the market after harvest as proper storage facilities are not available with them. The present storage capacities are quite inadequate and most of the available units are traditional and unscientific.

Tissue Culture Unit

Plant tissue culture is a collection of techniques used to maintain or grow plant cells, tissues or organs under sterile conditions on a nutrient culture medium of known composition. Plant tissue culture is widely used to produce clones of a plant in a method known as micro propagation.

Plant tissue culture relies on the fact that many plant cells have the ability to regenerate a whole plant (totipotency). Single cells, plant cells without cell walls (protoplasts), pieces of leaves, stems or roots can often be used to generate a new plant on culture media given the required nutrients and plant hormones. Although some growers and nurseries have their own labs for propagating plants by the technique of tissue culture, additional number of laboratories need to be created to provide custom propagation services and commercially viable plants to propagate in a laboratory.

Off-season Moringa Production – Pods and Leaves

Extremes of weather conditions that prevail in Northern States during Kariff as well as Rabi seasons do not favour the cultivation of Moringa. Hence truckloads of drumsticks are being transported from TN, AP and Karnataka to Northern States. Though the moringa pod is demanded throughout the year, the production is meager during winter and rainy seasons owing to the inadequate thermal requirements of the crop. Various systems of cultivation are in vogue to

produce moringa round the year production. Commercial cultivation of annual moringa PKM-1 can fit into any crop rotation. Though it is annual, it is amenable for rationing twice.

Establishment of Mushroom unit

Mushrooms have been valued throughout the world as both food and medicine for thousands of years. They are a rich source of nutrition and form a major chunk of health foods. Earlier mushroom eating was restricted to specific regions and areas of the world but due to globalization, interaction between different cultures, growing consumerism has ensured the accessibility of mushrooms in all areas. Mushrooms are increasingly gaining acceptance in different Cusines and in everday consumption. They have created a space in a common man's kitchen. Also, current trend of consumption conveys the opportunity that lies in the area of mushroom exports.

Rainfed Area Development Programme (RADP)

Rainfed areas assume special significance in terms of ecology, agricultural productivity and livelihood for millions of rural households in India.

To ensure agriculture growth in the rainfed areas, the Government of India launched a new scheme 'Rainfed Area Development Programme (RADP)' in the year 2011-12 as a sub-scheme under Rashtriya Krishi Vikas Yojana (RKVY).

It aims at improving quality of life of farmers especially, small and marginal farmers by offering a complete package of activities to maximize farm returns. RADP focuses on Integrated Farming System (IFS) for enhancing productivity and minimizing risks associated with climatic variabilities.

Coastal area development programme

The coastal area in Tamil Nadu is susceptible to cyclones periodically, which cause damage to life and property. The coastal area supports several important economic activities such as fisheries, ports, industries and tourism. Most ecologically critical and threatened areas in the coastal areas are coastal wet lands especially lagoons and estuaries and their mangrove swamps. The coastal areas provide food and shelter for waterfowls, fishes, crustaceans, molluscs including some of the world's lucrative fisheries. Mangroves and coral reef system are important for protecting shorelines and coastal lines against erosion. Thus coastal areas play a prominent role in the human life.

Infrastructure Development

Mushroom production

Commercial production of edible Mushrooms converts the agricultural, industrial, forestry and household wastes into nutritious food (Mushroom). Indoor cultivation of oyster mushrooms utilizes the vertical space and is regarded as the highest protein producer per unit area and time – almost 100 times more than the conventional agriculture and animal husbandry.

Supporting structures for vegetable production

Vegetables are excellent source of vitamins and minerals such as calcium, iron besides proteins and carbohydrates. Vegetables combat under nourishment and are known to be a cheapest source of natural protective tools.

a. Staking, trellis and propping

Though most vegetables grow on their own, plants with vining and sprawling growth or with brittle stems and heavy fruits need support. Peas, cucumbers, pole beans, tomatoes, squash, eggplants and peppers benefit from trellising, caging or staking. The trick to heavy harvests knows which vegetable support system works best for each plant. Trellising, which involves tying plant stems to vertical structures with garden twine or plant ties, allows you to fit more plants in the garden. It is the preferred support method for peas, indeterminate vine-type tomatoes, pole and runner beans, cucumbers and smaller squash varieties.

b. Pandal structure

Pandal vegetables, being short duration crops, fit very well in the intensive cropping system. It offers viable option for the growers to get increased income per unit area. It includes number of vegetables viz. bitter gourd, snake gourd, ribbed gourd, pandal avarai etc. These vegetables are grown on commercial scale and are capable of giving high yields and high economic returns to the growers. It has tremendous market potential. The cultivation of vegetables is constrained due to high initial investment cost. With the objective of enhancing area under pandal vegetables and encouraging farmers to obtain increased income, it is proposed to implement the project on “Encouraging Cultivation of Pandal Vegetables. In this situation, financial support for the establishment of pandal structures for the vegetables will increase in the area and production of pandal vegetables. Along with which the support on supply of high yielding / hybrid seed materials for cultivation will be additional assistance among the farmers to get enhanced yield per unit area.

District Horticulture information and training centre

The information center also houses a training center where all the training programmes are being imparted. This includes training under various schemes like Mission for Integrated Development of Horticulture, Micro Irrigation, Medicinal plants, Perimetro vegetable cluster development Scheme, ATMA (SSEPER) etc. The Centre would not only provide employment, but also training to agriculturists in batches on raising vegetable and horticultural crops and conduct orientation programme for Department officials.

Additionally, to augment the promotion of cut flowers and other horticulture crops cold storage facilities can also be made in the horticulture complex. The other facilities like glass house, green house for production and multiplication of ornamental plants will also be established in the training centre for demonstration purpose.

Community Seed Bank

Community Seed Banks (CSBs) are places of storage where indigenous seed varieties are conserved and managed by community members. These ex-situ conservation sites provide farmers with free and easy access to traditional seeds under the condition that a farmer returns twice the amount of seeds he or she borrowed. They not only reduce farmers' dependence on seed companies but also help conserve the agro-biodiversity of their villages. These seed banks form the cornerstone of GREEN's efforts for biodiversity conservation through community empowerment.

Modernization of State Horticulture Farms

In Tamil Nadu, there are 52 State Horticulture Farms including six parks and garden. The prime objectives of these farms are to produce pedigree planting materials of fruits, flowers, spices and vegetables. The quality planting materials produced in these farms are distributed to the farmers directly and through various schemes of the department. The parks and garden serve as study centre to the students apart from educating the public on Eco preservation.

It is programmed to expand the production of planting materials of various kinds of fruits viz., mango, guava, sapota and flowers like rose, jasmine and ornamental plants and avenue trees by modernizing the nurseries, developing the farms as demonstration centres for the latest techniques in horticulture, enhancing the productivity and augmenting farm mechanization for increasing the efficiency. It is aimed to enhance the productivity levels of orchard crops by 30 per cent and increase the production level of planting materials by 25 per cent covered in all blocks.

Establishment of Processing Units

Tamil Nadu produces nearly 110 lakh tones of vegetables and fruits but it has only 136 cold storage locations with a capacity of 2.3 lakh tonnes which is shared amongst marine, milk and agro produce. The combined capacity is small as compared to required capacity. Further it has been reported that nearly 30 per cent of the horticultural crops produced are wasted due to rotting and in the post-harvest supply chain of storage and handling. Reducing this wastage calls for conversion of value added horticultural crops, fruits and flowers. Hence, it has been programmed to establish horticultural processing unit and essential oil extraction unit covered in all blocks except vilatikulam.

Crop Insurance

Crop Insurance coverage has to be done for major crops like paddy, millets, pulses, oilseeds, sugarcane, cotton, cash crops and all Horticulture crops in the notified areas covered in all blocks except karungulam.

Horticultural mechanization

With increasing agricultural labour Shortage in India, a calculated shift to mechanization is imperative. Not only does mechanization provide for optimal utilization of factor resources (viz., land, labour, water, capital and expensive farm inputs), it also helps farmers to save valuable time and effort. Judicious use of time, labour and resources helps facilitate sustainable intensification (multi-cropping) and timely planting of crops and towards giving crops more time to mature, leading to improved productivity.

Micro irrigation in horticultural crops

Micro-irrigation will generally use less than half the volume of water required by the more traditional ‘watering’ systems such as sprinkler irrigation. Lower pressures used mean less energy for pumping while precise placement of more exact water volumes enhances and improves water management. Micro Irrigation system scales down requirement of labour and takes care of application of fertilizers.

Conducting Field Days / Shows and Farmer's mela

Regular training programmes on relevant topics for Upgradation of knowledge and skill of extension functionaries of development department and farmers are essential. Apart from this, exhibition, horticulture show, Farmers' Mela, Field Days in farmer's field and Frontline Demonstrations to demonstrate technologies are to be regularly conducted.

Budget

The budget requirement for fulfilling the various interventions is ₹.7410.87 lakhs.

Implementing agency

The projects will be implemented by the Department of Horticulture.

Table 4.18. Budget requirement for horticulture interventions in Thoothukudi district

(₹ in Lakhs)

Sl. No.	Interventions	Unit	Unit cost	Blocks covered	2017-2018		2018-2019		2019-2020		2020-2021		2021-2022		Total	
					Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.
A	**Production Growth**															
I	**Area expansion of fruit crops**															
1	Banana / Hill Banana sucker & Pine apple sucker	Ha	0.875	All Blocks except B7,B12	130	113.75	130	113.75	160	140.00	165	144.38	165	144.38	750	656.25
2	HDP in Mango, Guava, Litchi, Pomegranate	Ha	1	B2,B3,B4,B5,B6, B9	10	10.00	10	10.00	10	10.00	10	10.00	10	10.00	50	50.00
3	Normal Planting in lime / lemons	Ha	0.6	All Blocks except B1,B8,B10,B11	35	21.00	35	21.00	38	22.80	47	28.20	47	28.20	202	121.20
4	Normal Planting in Mango	Ha	0.6	B2,B3,B4,B5,B6, B9	30	18.00	30	18.00	30	18.00	42	25.20	42	25.20	174	104.40
5	Normal planting in Guava	Ha	0.6	All Blocks except B1,B8,B10,B11	28	16.80	28	16.80	30	18.00	38	22.80	39	23.40	163	97.80
6	Normal planting in Sapota	Ha	0.6	B2,B3,B5,B8,B11	10	6.00	8	4.80	8	4.80	8	4.80	8	4.80	42	25.20
7	Normal planting in Amla	Ha	0.6	B2,B3,B4,B5	8	4.80	12	7.20	12	7.20	16	9.60	16	9.60	64	38.40
8	Normal planting in Papaya	Ha	0.6	All Blocks except B1,B7,B11,B12	20	12.00	25	15.00	28	16.80	31	18.60	35	21.00	139	83.40
9	Normal planting in Jack	Ha	0.6	B6	1	0.60	1	0.60	1	0.60	1	0.60	1	0.60	5	3.00
10	Normal planting in Pomegranate	Ha	0.6	B2,B3,B4,B5,B9	5	3.00	5	3.00	9	5.40	9	5.40	13	7.80	41	24.60
11	Commercial production of Traditional fruits (Woodapple, Manila Tamarind, Jamun, Ber, Karonda, Annona, Egg fruit, etc.,)	Ha	0.6	All Blocks except B1,B6,B10,B11	11	6.60	11	6.60	11	6.60	11	6.60	11	6.60	55	33.00
II	**Area expansion of vegetable crops**															
12	Brinjal	Ha	0.5	All Blocks except B7,B11, B12	30	15.00	30	15.00	30	15.00	34	17.00	34	17.00	158	79.00
13	Bhendi	Ha	0.5	B2,B3,B4,B5,B6,	51	25.50	58	29.00	70	35.00	71	35.50	81	40.50	331	165.50

Sl. No.	Interventions	Unit	Unit cost	Blocks covered	2017-2018		2018-2019		2019-2020		2020-2021		2021-2022		Total	
					Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.
				B9												
14	Green Chillies	Ha	0.5	B2,B3,B4,B5,B6	42	21.00	44	22.00	46	23.00	48	24.00	65	32.50	245	122.50
15	Tomato	Ha	0.5	All Blocks except B7,B11, B12	30	15.00	31	15.50	35	17.50	36	18.00	41	20.50	173	86.50
16	Gourds including pumpkin and tinda	Ha	0.5	All Blocks except B1,B8,B10, B11	27	13.50	28	14.00	31	15.50	31	15.50	35	17.50	152	76.00
17	Greens	Ha	0.5	All Blocks except B1,B7,B8,B10, B11, B12	10	5.00	10	5.00	10	5.00	10	5.00	10	5.00	50	25.00
18	Small Onion	Ha	0.5	All Blocks except B1,B8,B9,B10,B11	242	121.00	244	122.00	259	129.50	259	129.50	274	137.00	1278	639.00
19	Annual Moringa	Ha	0.5	B3,B4,B5,B6,B7, B9,B12	20	10.00	20	10.00	23	11.50	24	12.00	27	13.50	114	57.00
20	Cucumber/gherkin	Ha	0.5	B2,B3,B4,B5,B9	6	3.00	6	3.00	6	3.00	6	3.00	6	3.00	30	15.00
21	Melons	Ha	0.5	B2,B3,B4,B5,B9	13	6.50	13	6.50	13	6.50	17	8.50	17	8.50	73	36.50
22	Cultivation of hybrid Vegetables under protected structures	1000 Sq.m	1.4	All Blocks except B1,B6,B7,B8,B10,B11	60	84.00	0	0.00	0	0.00	0	0.00	0	0.00	60	84.00
III	**Area expansion of Medicinal and Aromatic plants**															
23	Senna	Ha	0.2988	B2,B3,B4,B5,B6, B7,B12	235	70.22	245	73.21	250	74.70	260	77.69	285	85.16	1275	380.97
IV	**Area expansion of Spices crops**															
24	Seed and Rhizomatic spices (Coriander, Turmeric, Ginger, Dry Chilly, Cumin, Fennel, Fenugreek, Dil, Cardamom etc.,)	Ha	0.3	B3,B4,B5,B7,B12	245	73.50	245	73.50	265	79.50	265	79.50	280	84.00	1300	390.00
25	Perennial spices (Pepper, Curry leaf, All spice, Cinnamon, Clove, Tamarind, Nut meg etc.,)	Ha	0.5	B2,B3,B4,B5,B7	11	5.50	11	5.50	11	5.50	13	6.50	14	7.00	60	30.00
V	**Area expansion of**															

Sl. No.	Interventions	Unit	Unit cost	Blocks covered	2017-2018		2018-2019		2019-2020		2020-2021		2021-2022		Total	
					Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.
	Flower crops															
26	Loose flowers - Jasminumsp, Crossandra, Marigold, Rose, Chrysanthemum, Nerium, Torenia	Ha	0.4	B2,B3,B4,B5,B6, B9	22	8.80	22	8.80	27	10.80	27	10.80	32	12.80	130	52.00
27	Bulbous flowers - Tube rose, Gladioli, Dahlia, Bird of paradise, Heliconia, Tulip	Ha	1.5	B2,B3,B5	7	10.50	7	10.50	10	15.00	10	15.00	11	16.50	45	67.50
VI	**Area expansion /Gap filling of Plantation crops**															
28	Cashew	Ha	0.5	B8	5	2.50	5	2.50	6	3.00	6	3.00	7	3.50	29	14.50
29	Betelvine	Ha	0.5	B9	10	5.00	10	5.00	10	5.00	10	5.00	10	5.00	50	25.00
30	Bamboo and Other crops	Ha	0.6	B3,B4,B5,B6	4	2.40	4	2.40	7	4.20	7	4.20	7	4.20	29	17.40
VII	**Rejuvenation/INM -IPM /Mulching/Anti bird net**															
31	INM/IPM for Horticultural crops	Ha	0.04	All Blocks	165	6.60	165	6.60	225	9.00	230	9.20	235	9.40	1020	40.80
32	Mulching	Ha	0.32	B6	0	0.00	5	1.60	5	1.60	5	1.60	5	1.60	20	6.40
VIII	**Pollination Support through Bee Keeping**															
33	Bee hive & Colony	No	0.04	All Blocks	140	5.60	145	5.80	210	8.40	215	8.60	220	8.80	930	37.20
IX	**Organic Farming**															
34	Organic farming and PGS certification in 50 acre cluster	1 cluster	14.95	B6	0	0.00	2	29.90	1	14.95	1	14.95	0	0.00	4	59.80
35	HDPE Vermibed	No	0.16	All Blocks	23	3.68	23	3.68	29	4.64	30	4.80	30	4.80	135	21.60
X	**Rainfed Area development**															
36	Integrated farming system - Horticulture Based	Ha	0.5	All Blocks except B1,B8,B9,B10,B11	70	35.00	70	35.00	70	35.00	75	37.50	75	37.50	360	180.00

Sl. No.	Interventions	Unit	Unit cost	Blocks covered	2017-2018		2018-2019		2019-2020		2020-2021		2021-2022		Total	
					Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.
	farming															
37	Moisture stress management - Minimum irrigation gurantee by PUSA hydrogel	Ha	0.1	All Blocks	94	9.40	94	9.40	115	11.50	115	11.50	145	14.50	563	56.30
B	**Infra structures and Assets creation**															
38	Poly Green House	1000 Sq.m	9.35	B6,B9,B11	3	28.05	3	28.05	3	28.05	2	18.70	0	0.00	11	102.85
II	**Mushroom production**															
39	Cottage mushroom unit	1 No.	1	B12	0	0.00	1	1.00	1	1.00	1	1.00	0	0.00	3	3.00
III	**Vermicompost unit**															
40	Permanent Vermicompost Unit	600 cu.ft	1	All Blocks except B1	9	9.00	9	9.00	11	11.00	11	11.00	11	11.00	51	51.00
IV	**Supporting structures for Horticulture crop production**															
41	Permanent Pandhal structure	Ha	4	All Blocks except B1,B6,B8,B10,B11	12	48.00	12	48.00	16	64.00	18	72.00	18	72.00	76	304.00
V	**District Horticulture information and training centre**															
VI	**Community seed bank**															
C	**Special interventions**															
42	Promotion of Roof top Garden/ Potager garden Kit	No	0.005	All Blocks	1300	6.50	1300	6.50	1300	6.50	1300	6.50	1300	6.50	6500	32.50
43	Banana Bunch Sleeve	Ha	0.25	All Blocks except B7,B12	130	32.50	145	36.25	150	37.50	150	37.50	150	37.50	725	181.25
44	AESA based IPM in fruits and vegetables Pheramone trap	Ha	0.04	All Blocks	240	9.60	240	9.60	280	11.20	280	11.20	280	11.20	1320	52.80

Sl. No.	Interventions	Unit	Unit cost	Blocks covered	2017-2018		2018-2019		2019-2020		2020-2021		2021-2022		Total	
					Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.
45	AESA Based IPM in fruits and vegetables Yellow sticky trap	Ha	0.04	All Blocks	240	9.60	240	9.60	280	11.20	280	11.20	280	11.20	1320	52.80
46	AESA Based IPM in fruits and vegetables Light trap	Ha	0.08	All Blocks	240	19.20	240	19.20	280	22.40	280	22.40	280	22.40	1320	105.60
D	**Post Harvest Management**															
1	Low cost onion structure 25 mt	1 No	1.75	B7,B12	2	3.50	2	3.50	2	3.50	2	3.50	2	3.50	10	17.50
E	**Development of Farms, Nurseries and Parks**															
1	Developmental activities in new/ exsisting state Horticultural farm, Keelapalur	No	25	B2	1	25.00	0	0.00	0	0.00	0	0.00	0	0.00	1	25.00
F	**Mechanization - Machineries, Equipments& Tools**															
1	Power tiller/Tractor/Minitractor	Nos	1	All Blocks except B2,B5,B7,B11,B12	15	15.00	15	15.00	15	15.00	15	15.00	15	15.00	75	75.00
2	Manual Sprayer-Knapsack/Foot operated Sprayer	Nos	0.12	B3	10	1.20	10	1.20	10	1.20	10	1.20	10	1.20	50	6.00
3	Power operated sprayer	Nos	0.05	All Blocks except B3	105	5.25	105	5.25	105	5.25	105	5.25	105	5.25	525	26.25
4	5 layered Polythene spread sheets for drying horticulture produce	No	0.16	B2,B3,B4,B5,B7, B12	16	2.56	16	2.56	16	2.56	16	2.56	16	2.56	80	12.80
G	**Water / Irrigation Management**															
1	Micro Irrigation - Drip	Ha	1.12	All Blocks	360	403.20	385	431.20	415	464.80	445	498.40	450	504.00	2055	2301.60
H	**Capacity Building**															

Sl. No.	Interventions	Unit	Unit cost	Blocks covered	2017-2018		2018-2019		2019-2020		2020-2021		2021-2022		Total	
					Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.
1	Training to farmers within the State. 2 days Rs.1000/farmer/ day	No	0.02	All Blocks	105	2.10	120	2.40	120	2.40	120	2.40	120	2.40	585	11.70
1	Computerization & governance	No	1	B10	0	0.00	0	0.00	0	0.00	1	1.00	1	1.00	2	2.00
2	Publicity and Documentation	No	0.5	All Blocks except B1,B6,B10, B11	9.4	4.70	9.9	4.95	14.4	7.20	14.9	7.45	15.4	7.70	64	32.00
I	**Crop Insurance and Risk Mitigating schemes**															
1	Crop Insurance	Ha	0.025	All Blocks	0	0.00	110	2.75	120	3.00	130	3.25	140	3.50	500	12.50
	Grand Total					**1395.71**		**1368.15**		**1492.25**		**1565.52**		**1589.24**		**7410.87**

Alwarthirunagiri - B1, Karungulam - B2, Kayathar - B3, Kovilpatti - B4, Ottapidaram - B5, Pudukottai - B6, Pudur - B7, Sathankulam - B8, Srivaikundam - B9, Tirchendur - B10, Udangudi - B11, Vilathikulam - B12

4.3.Agricultural Engineering

Agricultural mechanization is the process whereby equipments, machineries and implements are utilized to boost agricultural and food production. It is the application of machineries, equipments and implements in the day to day farm activities to increase marginal output in food production and poverty eradication. It increases productivity of land and labour by meeting timeliness of farm operations and increase work out-put per unit time. Besides its paramount contribution to the multiple cropping and diversification of agriculture, mechanization also enables efficient utilisation of inputs such as seeds, fertilisers and irrigation water. The agricultural mechanization is the only way out to face the challenge of farm worker's shortage. Thus the ultimate objective of Agricultural Mechanization Strategies in developing countries is to help increase the welfare of farm households and create positive dynamics and opportunities for economic growth in rural areas.

Strategies:

- Promotion and strengthening of Agricultural Mechanization through training, Testing and Demonstration in order to ensure performance testing of agricultural machinery and equipment, capacity building of farmers and end users and promoting farm mechanization through demonstrations covered in all blocks.
- Demonstration, Training and Distribution of post-harvest Technology and Management (PHTM) to popularize the technology for primary processing, value addition, low cost scientific storage/transport and the crop by-product management through demonstrations, capacity building of farmers and end users. Provides financial assistance for establishing PHT units covered in all blocks.
- Promotion of ownership to small and marginal farmers for various agricultural machinery and equipments such as Tractors, Power tillers, Rice transplanter, Self-propelled machinery, Tractor/Power tiller drawn equipments (MB Plough, Disc plough, Cultivator, Harrow, Leveler Blade, Ridger, Laser Land Leveller, Reversible Mechanical Plough, Rotavator, Rotopuddler, Reversible Hydraulic Plough, Post hole digger, Reaper, Seed driller, Balers, Coconut thrash cutter, coconut frond chopper, Multi crop thresher, Paddy thresher, Brush cutter, Chaff cutter, Drum Seeder) and Plant protection equipments covered in all blocks .
- Provision of suitable financial assistance to establish farm machinery banks for custom hiring for appropriate locations and crops covered in all blocks.

- Establishment of hi-tech machinery hubs for high value crops like sugarcane, cotton etc covered in all blocks except Karungulam, Tiruchendur and Villatikulam block.
- Promotion of appropriate technologies and to set up farm machinery banks in identified villages covered in all blocks.
- Provision of financial assistance on per hectare basis to the beneficiaries hiring machinery/equipments from custom hiring centres covered in all blocks except Karungulam and Thoothukudi blocks.
- Increases the tractor hire services in the farms of small and marginal farmers
- Strengthening of Minor irrigation for the rainfed and hard rock areas. It would establish through construction of open well, tube wells and Bore wells. Revitalisation of wells by side boring and blasting in hard rock areas.
- Introduction of renewable energy in the villages which would replace other fuels. Also attractive for water pumping applications in remote areas. Hence solar operated photovoltaic water pumping system provides better sustainable alternative option to fulfill irrigation requirement of agriculture covered in all blocks.
- Provision of components such as High tech Earth excavator, Poly Green House with Fogging facility, Vermi Compost unit with packing accessories, Farm pond / Fish pond, Farmers kit (Crow bar, Hand hoe, rose can, pruning siccature, coconut dehusker, trolley etc.,), Land levelling, Pipe laying, Stening wall, Well deepening, Replacement of old Pumpsets, Infrastructure like packing unit, godown, cattle shed and Threshing floor, Publicity and propaganda for farm mechanization in AED, Special Training for Coconut Growers, Special Training for Coconut Tree Climbing, J C B, Mini Drill, Compartmental Bund Formation, Farm Ponds, Community Bore wells, Deepening of Open Wells, Renovation of MI Tanks, Check Dam, Percolation Pond, Recharge Shaft, Summer Ploughing, PVP pipe laying, Replacement of Submersible Motors pump sets, Telescopic Pruner, Motorized Rubber Roller, Trays for Paddy Nursery Raising, Combine Harvester, Diesel Pump, Rotary Tiller, Smoke House, Mist Blower, Tea Harvester, Construction of LD & MI Repair Shed and Construction of Training Centre for farmers with furniture and accessories at the department of Agricultural engineering
- Strengthening of communication and information facilities in order to disseminate the information in rural areas covered in all blocks.
- Awareness to be created towards the usage of Sugarcane infielder, Bird scarer, Mechanized row crop cultivation and Modernization of tractor workshop which indirectly increase the production covered in all blocks.

- Promotion of agro-processing and management machinery at community level through supply of post-harvest machinery such as self-propelled/other driven horticultural machinery (Chain saw/ wheel barrow/ Mango grader/ planter and other suitable self-propelled machineries and equipments), Manual horticultural equipments (Aluminium ladder/ Ladder, Aluminium pole, Plucker), Post-harvest equipments for grains, oil seeds and Horticultural crops (Mini Rice mill, Mini Dhall mill, Millet Mill, Oil mill with filters, Extractor, pomegranate air extractor, Custard apple pulper, Dehydration unit, Pricking Machine, Humidifier, Packing machine, power driven dehusker, thresher, Harvester, De-spiking, Deconing, Peeler, Splitter, Stripper, Boiler, Steamer, Dryer solar, Washing Machine, Grinder, Pulveriser, Polisher, Cleaner cum grader, gradient separator, Specific gravity separator) this would make sure that more value is added to farm outputs locally covered in all blocks.
- Promotion of Bio-mass gasifier unit which hold huge potential technology for decentralized electricity generation in rural villages. Biomass is a CO2 neutral fuel and, therefore, unlike fossil fuels such as diesel does not contribute to net CO2 emissions, which makes biomass based power generation systems an attractive option in mitigating the adverse effects of climate change covered in all blocks.
- Establishment of Agricultural Engineering Extension centres in order to collect information related to Government subsidy on agricultural / machineries / equipment / irrigation systems etc., compilation of latest technologies related to Agricultural Engineering and Development of video cassettes library related to Processing of agricultural products, Working of important agricultural machines and equipment and Repair, maintenance and proper setting of the different agricultural Machines / and equipment covered in all blocks.
- Promotion of training to AED engineers on post-harvest techniques and bio energy
- Rehabilitation of irrigation network to bring water directly to the root zone of the crop, improve application and conveyance efficiency, thereby reduce the wastage of water due to flood irrigation covered in all blocks.
- Prevention of sea water intrusion through construction of subsurface dyke, Village Pond / Community Pond, Farm Pond, Recharge shaft and Weir/Bed Dam.
- Reclamation of problem soils which needs special management for satisfactory crop production. Physical limitations can be managed by irrigation, drainage, mulching, manuring, tillage, and soil conservation measures such as terracing, contouring, and cover crops whichever is appropriate covered in all blocks.

Expected outcome

Implementation of the above strategies such as supply of farm implements to carry out mechanised cultivation operations and demonstration to farmers the advantage of using Agricultural implements and machinery would increase the production and productivity. Post- Harvest Technologies to farmers would prevent loss of food grains during harvest and storage and Preserve the quality of produce in respect of perishable commodities. Disseminated technologies on renewable energies, in particular, solar energy for agricultural activities in respect of pumping with solar powered pumps, drying farm produce for enhancement of quality to fetch reasonable market price.

Budget

Agriculture continues to be the most predominant sector of this district economy, as 70 percent of the population is engaged in Agriculture and allied activities for their livelihood. Agricultural Mechanization could provide the stability in agricultural production in a sustainable manner to meet the food requirement of growing population and also to meet the raw material needs of agro based industries, thereby providing employment opportunities to the rural population. The Major component required to implement in this district are capacity building of farmers and end users with the budget of ₹27.80 lakhs, Financial assistance for the procurement of Agricultural Machinery, Post-harvest machinery and equipments in rural areas with the budget of ₹2436.01 lakhs, Establishment of Farm Machinery Banks, Hi-tech productive equipment hub, Promotion of Farm Mechanization in Selected Villages with the budget of ₹280.00 lakhs and also implementation of minor irrigation, Tractor hiring scheme, Solar energy, Innovative schemes of AED, Pilot mechanization Demonstration, Post-harvest technology and management machinery with budget of ₹1039.70 lakhs. Some other interventions such as Bio- mass gasifier, Construction of Agricultural Engineering Extension centres (AEECs) with the budget of ₹ 2227.50 lakhs are required to implement in this district to enhance the Agricultural Productivity. The overall budget requirement for implementation of above interventions is ₹6011.01 lakhs. The details of budget requirement for each intervention across the blocks are shown in Table 4.19.

Implementing agency

The projects will be implemented by the Department of Agricultural Engineering

Table.4.19. Budget requirement for Agricultural Engineering

(₹. in lakhs)

Sl. No	Interventions	Blocks Covered	Unit	Unit cost	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
	Capacity Building															
1	Demonstration of Agricultural Machinery	All Blocks	No's/Ha	0.04	34	1.36	38	1.52	30	1.20	34	1.36	34	1.36	170	6.80
2	Training of farmers	All Blocks except B2, B12, B9	No's/Ha	0.04	40	1.60	40	1.60	40	1.60	40	1.60	40	1.60	200	8.00
3	Training of Rural Youth in workshops	All Blocks except B2, B12, B9	No's/Ha	0.04	40	1.60	40	1.60	40	1.60	40	1.60	40	1.60	200	8.00
4	Demonstration of Post Harvest Technologies	All Blocks	No's/Ha	0.04	25	1.00	25	1.00	25	1.00	25	1.00	25	1.00	125	5.00
5	**Tractors**															
6	Tractor (15-20 PTO HP)	All Blocks	No's/Ha	4	23	92.00	20	80.00	20	80.00	20	80.00	20	80.00	103	412.00
7	Tractor (40-70 PTO HP)	All Blocks	No's/Ha	8.5	15	127.50	14	119.00	14	119.00	14	119.00	14	119.00	71	603.50
8	**Power Tillers**															
9	Power Tiller (8 BHP & above)	All Blocks	No's/Ha	1.75	44	77.00	45	78.75	45	78.75	45	78.75	45	78.75	224	392.00
10	**Rice Transplanter**															
11	Self Propelled Rice Transplanter (4 rows)	All Blocks	No's/Ha	2.5	2	5.00	2	5.00	2	5.00	2	5.00	2	5.00	10	25.00
12	**Self Propelled Machinery**															
13	Reaper cum Binder	All Blocks	No's/Ha	3	5	15.00	5	15.00	5	15.00	5	15.00	5	15.00	25	75.00
14	**Specialized Self Propelled Machinery**															
15	Reaper	All Blocks	No's/Ha	1.1	5	5.50	2	2.20	2	2.20	2	2.20	2	2.20	13	14.30
16	Post Hole Digger / Augur	B2, B12,	No's/Ha	0.63	2	1.26	0	0.00	0	0.00	0	0.00	0	0.00	2	1.26
17	**IntercultivationEquipments**															
18	Power Weeder (engine operated below 2 BHP)	All Blocks	No's/Ha	0.25	10	2.50	10	2.50	8	2.00	10	2.50	10	2.50	48	12.00

Sl. No	Interventions	Blocks Covered	Unit	Unit cost	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
19	**Harvesting and Threshing equipments**															
20	Brush Cutter	All Blocks	No's/Ha	0.25	2	0.50	2	0.50	2	0.50	2	0.50	2	0.50	10	2.50
21	**Inter Cultivation Equipments**															
22	Power Weeder (engine operated above 2 BHP)	All Blocks	No's/Ha	0.7	4	2.80	5	3.50	5	3.50	5	3.50	5	3.50	24	16.80
23	Chaff Cutter (Operated by engine / electric motor above 3-5 hp and by power tiller and tractor of below 35 BHP tractor)	All Blocks	No's/Ha	0.4	5	2.00	5	2.00	5	2.00	5	2.00	5	2.00	25	10.00
24	**a.Land Development, tillage and seed bed preparation equipments**															
25	MB Plow	B2, B12,	No's/Ha	1	2	2.00	0	0.00	0	0.00	0	0.00	0	0.00	2	2.00
26	Disc Plow	B2, B12,	No's/Ha	0.6	7	4.20	0	0.00	0	0.00	0	0.00	0	0.00	7	4.20
27	Cultivator	All Blocks	No's/Ha	0.3	12	3.60	5	1.50	5	1.50	5	1.50	5	1.50	32	9.60
28	Rotavator	All Blocks	No's/Ha	0.95	91	86.45	60	57.00	50	47.50	60	57.00	60	57.00	321	304.95
29	**b. Sowing Planting, Reaping and Digging Equipments:**															
30	Zero till seed cum fertilizer drill	All Blocks	No's/Ha	0.7	10	7.00	10	7.00	10	7.00	10	7.00	10	7.00	50	35.00
31	**d.Harvesting& Threshing Equipments**															
32	Thresher/Multi Crop threshers	All Blocks	No's/Ha	4	28	112.00	20	80.00	20	80.00	20	80.00	20	80.00	108	432.00
33	Paddy Thresher	All Blocks	No's/Ha	2.2	2	4.40	4	8.80	4	8.80	2	4.40	4	8.80	16	35.20
34	**e.Equipments for Residue management/Hay and Forage Equipments**															
35	Balers (Round)	All Blocks	No's/Ha	3.5	2	7.00	0	0.00	2	7.00	2	7.00	2	7.00	8	28.00

Sl. No	Interventions	Blocks Covered	Unit	Unit cost	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
36	**All Manual/animal drawn equipment/implements / Tools**															
37	Drum Seeder (Below 4 Row)	All Blocks	No's/Ha	0.1	0	0.00	2	0.20	2	0.20	2	0.20	2	0.20	8	0.80
38	Tree climber	B2, B12,	No's/Ha	0.07	2	0.14	0	0.00	0	0.00	0	0.00	0	0.00	2	0.14
39	Manual sprayer: Knapsack/foot operated sprayer	All Blocks	No's/Ha	0.015	41	0.62	10	0.15	10	0.15	10	0.15	10	0.15	81	1.22
40	Powered Knapsack Sprayer/Power operated Taiwan sprayer (capacity 8-12 lts)	All Blocks	No's/Ha	0.06	179	10.74	10	0.60	10	0.60	10	0.60	10	0.60	219	13.14
41	Powered Knapsack Sprayer/Power operated Taiwan sprayer (capacity above 12-16 lts)	All Blocks	No's/Ha	0.08	10	0.80	10	0.80	10	0.80	10	0.80	10	0.80	50	4.00
42	Powered Knapsack Sprayer/Power operated Taiwan sprayer (capacity above 16 lts)	All Blocks	No's/Ha	0.1	2	0.20	4	0.40	2	0.20	4	0.40	2	0.20	14	1.40
43	Establishment of Farm Machinery Banks for Custom Hiring	All Blocks	No's/Ha	28	2	56.00	2	56.00	2	56.00	2	56.00	2	56.00	10	280.00
44	Purchase of Tractors for AED	B2, B12,	No's/Ha	8	0	0.00	0	0.00	0	0.00	2	16.00	0	0.00	2	16.00
45	Purchase of Tractor drawn implemnets for AED	All Blocks	No's/Ha	0.5	0	0.00	0	0.00	0	0.00	10	5.00	0	0.00	10	5.00
46	Purchase of Bull Dozers for AED	B2, B12,	No's/Ha	80	0	0.00	0	0.00	0	0.00	2	160.00	0	0.00	2	160.00
47	Purchase of Paddy Transplanter for AED	B2, B12,	No's/Ha	18	0	0.00	0	0.00	0	0.00	2	36.00	0	0.00	2	36.00
48	Purchase of Paddy combine Harvester for AED	B2, B12,	No's/Ha	17	0	0.00	0	0.00	0	0.00	2	34.00	0	0.00	2	34.00
49	**Solar Energy**															
50	**5 hp**	All Blocks	No's/Ha	3.75	10	37.50	10	37.50	10	37.50	12	45.00	12	45.00	54	202.50

Sl. No	Interventions	Blocks Covered	Unit	Unit cost	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
51	**upto 400sq.ft**	B2, B12, B9	No's/Ha	4.25	0	0.00	0	0.00	2	8.50	0	0.00	2	8.50	4	17.00
52	**Information Technology (IT) related items**															
53	Computer & its accessories	B2, B12, B9	No's/Ha	0.8	0	0.00	1	0.80	1	0.80	1	0.80	1	0.80	4	3.20
54	Tablet (Tab)	B2, B12, B9	No's/Ha	0.25	0	0.00	3	0.75	3	0.75	3	0.75	3	0.75	12	3.00
55	Xerox machine	B2, B12, B9	No's/Ha	1.5	0	0.00	1	1.50	1	1.50	1	1.50	1	1.50	4	6.00
56	**Post HarvestEquipments for food grains, oil seeds and Horticultural Equipments**															
57	Mini Dal Mill	All Blocks	No's/Ha	1.7	0	0.00	8	13.60	8	13.60	8	13.60	8	13.60	32	54.40
58	Millet Mill	All Blocks	No's/Ha	1.5	0	0.00	8	12.00	8	12.00	8	12.00	8	12.00	32	48.00
59	Oil mill with filter press (for all type of Horticulture / Food grain / Oil seeds crop)	All Blocks	No's/Ha	1.2	0	0.00	7	8.40	7	8.40	7	8.40	7	8.40	28	33.60
60	Extractor (for all type of Horticulture / Food grain / Oil seeds crop)	All Blocks	No's/Ha	1	0	0.00	4	4.00	4	4.00	4	4.00	4	4.00	16	16.00
61	Packing Machines (for all types of Horticulture / Food grain / Oil seeds crop)	All Blocks	No's/Ha	3	0	0.00	15	45.00	15	45.00	15	45.00	15	45.00	60	180.00
62	All types of Power driven Dehusker/ sheller/ Threshers/ Harvesters/ De-spiking/ DeconingMachine/ Peeler/ Splitter/ Stripper (for all type of Horticulture / Food grain / Oil seeds crop)	All Blocks	No's/Ha	1.2	0	0.00	15	18.00	15	18.00	15	18.00	15	18.00	60	72.00
63	All types of Washing Machines (for all type of Horticulture / Food grain / Oil seed crop)	All Blocks	No's/Ha	1.5	0	0.00	15	22.50	15	22.50	15	22.50	15	22.50	60	90.00

Sl. No	Interventions	Blocks Covered	Unit	Unit cost	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
64	All types of Grinder/ Pulveriser/ Polisher (for all type of Horticulture / Food grain / Oil seed crop)	All Blocks	No's/Ha	0.3	0	0.00	15	4.50	15	4.50	15	4.50	15	4.50	60	18.00
65	All types of Cleaner cum grader/ Gradient separator/ Specific gravity separator (for all types of Horticulture / Food grain / Oil seed crop)	All Blocks	No's/Ha	0.75	0	0.00	15	11.25	15	11.25	15	11.25	15	11.25	60	45.00
66	**Prevention of sea water intrusion**															
67	Subsurface dyke	All Blocks	No's/Ha	15	0	0.00	12	180.00	12	180.00	11	165.00	20	300.00	55	825.00
68	Village pond/community pond	All Blocks	No's/Ha	5.5	0	0.00	10	55.00	20	110.00	20	110.00	30	165.00	80	440.00
69	Farm Pond	All Blocks	No's/Ha	1	0	0.00	50	50.00	50	50.00	50	50.00	100	100.00	250	250.00
70	Recharge shaft	All Blocks	No's/Ha	1.5	0	0.00	20	30.00	25	37.50	100	150.00	50	75.00	195	292.50
71	Weir/ Bed Dam	B2, B12, B9	No's/Ha	30	3	90.00	0	0.00	0	0.00	0	0.00	0	0.00	3	90.00
72	Reclamation of Problem(Alkaline & Saline) soils	All Blocks	No's/Ha	0.6	350	210.00	200	120.00	0	0.00	0	0.00	0	0.00	550	330.00
	Total					**969.27**		**1141.42**		**1088.90**		**1442.36**		**1369.06**		**6011.01**

Alwarthirunagiri - B1, Karungulam - B2, Kayathar - B3, Kovilpatti - B4, Ottapidaram - B5, Pudukottai - B6, Pudur - B7, Sathankulam - B8, Srivaikundam - B9, Tirchendur - B10, Udangudi - B11, Vilathikulam - B12

4.4 Agricultural Marketing

The Government is taking every effort to attain sustainable agricultural development by transforming agriculture into a commercial venture, by switching over to new scientific methods of cultivation so as to increase the productivity manifold. Besides, through value addition, processing and utilization of the marketing opportunities, the incremental output can be ensured. To further improve the marketing opportunities and to reduce the loss of agricultural produces, several measures have to be taken up by way of interventions like promotion of commodity groups and market information, strengthening of Uzhavar shandies and regulated markets, construction of storage godown, provision of market access and market activities, supply chain and post-harvest management, infrastructure and assets, and capacity building of farmers.

The core problem however in Agribusiness development is the general failure in coordinating the decisions of the private stakeholders *viz.,* farmers, traders and agricultural processors and service providers by the government and non-governmental sectors. In fact farmers fail to link themselves through effective producer-organizations to undertake joint decisions in production and marketing as well. Such weak linkages also due to limited access to relevant market intelligence and inadequate market infrastructure. Farmers are also poorly linked to research and extension service providers to address their specific technology and knowledge needs that would enable them into high-value production systems.

Entrepreneurs also have weak linkages with the farmers through contracts and vertical integration arrangements and are away from consumers because of absence of organized retail chains. Linkage with service providers are characterized by lack of confidence. The inadequacy in certification, quality assurance systems and inadequate infrastructure continues to limit the integration of production and international markets.

Agricultural produce are seasonal and perishable in nature. In a good season there may be a local glut, but because of insufficient transport facilities, lack of good roads and poor availability of packaging materials, the surplus cannot be taken quickly enough to the natural markets in urban areas. Moreover, the surplus often cannot be stored for sale in the off-season because of inadequate local storage facility; the farmers are often forced to market their produce at low price. Thus, the cultivars do not get a good price for their produce because of the glut, and some of it is spoiled resulting in complete loss. Currently pulses are processed manually using thirugu, ural, chakki, etc., which is laborious and time consuming. Due to existing problems in processing of pulses and millets, their market is not profitable for the farmers growing pulses. To reduce the loss of agricultural produce which are up to 30 per cent, necessary provisions are

needed to ensure remunerative price to the produce, encourage processing from the present level of 10 per cent of the total.

So, to accelerate the growth substantially, a new way of linking of Agricultural produce and marketing and promoting Agribusiness are focused. Promotion of commodity groups, farmer producer agencies, marketing organization and market linkage, encouraging of private players in marketing, value addition, crop specific supply chain management, more infrastructural facilities for processing and sensitizing the farmers for market-led agriculture by rendering crop advisory and market information are focused. Agri-business also contributes to the production of higher-value products and diversification away from the staple foods. Through this diversification and the development of the value chain between producers and consumers, the rural economy benefits from innovation and the creation of non-farm employment.

Components

- Promotion of commodity groups and market information are covered in kovilpati, kayathar, ottapidaram, Villatikulam and Thoothukudi blocks.
- Constructions of Storage godown for commodity groups are covered in all blocks except Kovilpati, Vilatikulam and Pudur blocks.
- Constructions of drying yards are covered in all blocks.
- Upgradation of rural shandies and uzhavar shandies in Kovilpati block.
- Strengthening of Regulated Markets are covered in all blocks.
- Formations of Farmer Producer Organizations (FPO) are covered in all block except sattankulam, villatikulam and pudur.
- Distribution of Turmeric boiler, grader, polisher, pulvariser covered in all blocks.
- Groundnut decorticator, potato harvester, Coconut climber in Srivaikundam, Ottapidaram, Vilatikulam and Pudur block.
- Promotion of processing units – banana, cardamom, millets, and pulses are covered in all blocks.
- Promotion of cold storage facilities
- Distribution of plastic crates to vegetable commodity group farmers covered in all blocks except Karyankulam,Udankudi, Kayathar and Pudur.

- Solar drier covered in all blocks.
- Market intelligence/market advisory generation and dissemination are covered in all blocks.
- Infrastructure and assets in Srivaikundam, Ottpidaram and pudur blocks.
- Imparting value addition trainings to commodity group farmers are covered in all blocks.
- Exposure visit (within state & outside state) for commodity group farmers to acquire value addition technologies covered in all blocks.

Budget

The district plan proposes an outlay of Rs.4256.52 lakhs over a period of five years for Namakkal district (Table). Among the various strategies, strengthening of uzhavar shandies requires ₹.84.47 crores followed by promotion of commodity groups and market information (₹.8.57 crores). Other three strategies viz. Formation of FPO, provision of market access and market activities, and capacity building, put together account for 5.10 crores of the total funds requirements of Agricultural Marketing sector in Namakkal district.

Expected Outcome

The expected impact of the intervention will be increasingly competitive agribusiness sector leading to diversification, higher-value added products and higher incomes for farmers, farm workers and entrepreneurs and reduced rural poverty. The interventions will facilitate the development of a competitive agriculture sector, promoting diversification and contributing to the transformation of agriculture into a system producing higher value produces. The interventions will also provide higher-value for consumers, value that will be shared as distributed benefits to value chain stakeholders including farmers, entrepreneurs and workers.

Implementing Agency

The Block-level officials of the Department of Agricultural Marketing and Agri-Business will implement the programs.

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Table 4.20. Budget for strengthening of Agricultural Marketing and Agri-Business in Thoothukudi District

(₹. in lakhs)

Sl. No	Intervention	Unit	Unit cost	Blocks Covered	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
	Promotion of Commodity Groups and Market Information															
1	e-learning Centre	Nos.	10	B7, B8, B9, B10, B11	4	40.00	0	0.00	0	0.00	0	0.00	0	0.00	4	40.00
2	Integrated Commodity Management through Aggregation	Nos.	250	B7, B8, B9, B10, B11	3	750.00	2	0.00	2	0.00	2	0.00	2	0.00	11	750.00
	Strengthening of UzhavarSandhai and Regulated Market															
3	Drying Yard	Nos.	6	All Blocks	51	306.00	39	234.00	48	288.00	38	228.00	41	246.00	217	1302.00
4	Storage godown	Nos.	1, 10	All Blocks, B7,B10, B11	33	60.00	24	0.00	20	0.00	20	0.00	21	0.00	118	60.00
5	Traders shop	Nos.	20	B7, B10, B11	15	300.00	0	0.00	0	0.00	0	0.00	0	0.00	15	300.00
6	Transaction Shed	Nos.	20	B7, B10, B11	3	60.00	0	0.00	0	0.00	0	0.00	0	0.00	3	60.00
7	Up gradation of UzhavarShadhais	Nos.	10	B7		0.00	0	0.00	0	0.00	0	0.00	1	10.00	1	10.00
	Formation of FPO / Strengthening of Existing Commodity Groups															
8	FPO	Nos.	5,	All Blocks except B6, B10, B11	14	80.80	14	62.88	14	20.88	12	0.00	12	0.00	66	164.56
9	Dunnage	Nos.	0.04	All Blocks	615	24.60	495	0.00	480	0.00	470	0.00	465	0.00	2525	24.60
10	Plastic crates	Nos.	0.004	All Blocks except B1, B5, B8, B11	260	1.04	265	1.06	255	1.02	260	1.04	250	1.00	1290	5.16

Sl. No	Intervention	Unit	Unit cost	Blocks Covered	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
11	Tarpaulin	Nos.	0.1	All Blocks	830	83.00	665	0.00	630	0.00	600	0.00	620	0.00	3345	83.00
12	SCM-PPC for Banana and Onion, Creating infrastructure, Ripening Chamber, Weigh Bridge, Grading and Packing hall,Onion Grading machine and other accessories	Nos.		B2, B9, B10, B11	3	1000.00	3	373.50	0	0.00	0	0.00	0	0.00	6	1373.50
	Capacity building Programme															
13	Exposure Visits - within state	Nos.	0.5	All Blocks	45	22.50	40	0.00	46	0.00	38	0.00	43	0.00	212	22.50
14	Exposure Visits - outside state - 3 days	Nos.	1.5	All Blocks	16	24.00	14	0.00	19	0.00	14	0.00	19	0.00	82	24.00
15	Training on Market led Extension, Agmark grading&Food safety, post harvest technology, Supply Chain Management, Grading-sorting-packing, Market linkages & Exports, Food processing and value addition at district level	Nos.	0.4	All Blocks	93	37.20	93	0.00	81	0.00	84	0.00	80	0.00	431	37.20
	Total					**2789.14**		**671.44**		**309.90**		**229.04**		**257.00**		**4256.52**

B1 -Karungulam, B2-Srivaikundam, B3-Alwarthirunagari, B4-Tiruchendur, B5-Udangudi, B6-Sattankulam, B7-Kovilpatti, B8-Kayathar, B9-Ottapidaram, B10-Vilathikulam, B11-Pudur, B12-Thoothukudi

4.5 Seed and Organic Certification in Thoothukudi District

Seed certification is a legally sanctioned system for quality control of seed multiplication and production. The immediate objective of seed certification is to supply high quality seed to farmers and other growers, which is true to identity, high in purity and germination capacity and free from certain pests and diseases. Seed quality is most important in crop production, as high quality seed is essential for good crop yields and good returns, and minimize the likelihood of crop failure. Moreover, growing consciousness of health hazards due to possible contamination of farm products from use of chemicals have immensely contributed to the revival of organic agriculture. Organic certification is a certification body for organic production which was established as a government department on 17 of May 2007. Thus the major focus of the department will be creation of new facilities for better certification by strengthening the lab facilities, and infrastructure, create more awareness on quality seed and organic agriculture through capacity building, expanding communication and networking facilities in order to enhance the activities on seed and organic certification.

Project components

1. Strengthening/creation of infrastructure in laboratories and communication and networking facilities are covered in all blocks.
2. Capacity building are covered in all blocks.

Expected outcome

Enhancement of laboratory facilities, infrastructure, capacity building, communication and networking would promote the quality of seed and organic certification.

Budget

The budget requirement for fulfilling those interventions is ₹41.52 lakhs.

Implementing agency

The projects will be implemented by the Directorate of seed and organic certification.

Table.4.21. Budget requirement for Seed and Organic Certification

(₹. in lakhs)

Sl. No	Interventions	Blocks Covered	Unit	Unit cost	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
I	**Strengthening of Seed Certification lab**															
	Blower, Conductivity meter, Dehuller/Scarifier, Dehumidifier Air Conditioner, Digital moisture meter, Dunnage, Fabricated display Racks ,Geaser, Generator, Heater,Hot air oven,Humidifier,Incubator,Induction stove,Microscope,Moisture meter,Packing machine,R. O system,Sample racks,Seed Grinder,Sieve,Thermohydro meter,Dunnage,Trolley for carriages,Working chair,Working table, Miscellaneous,	All Blocks	No's	13.36	1.00	13.36	1.00	13.36	0.00	0.00	0.00	0.00	0.00	0.00	2.00	26.72
II	**Strengthening of communication and networking facilities**															
	Computer accessories	All Blocks	No's	0.50	20.00	10.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	20.00	10.00
	Capacity Building															
	Training to seed grower for quality seed production	All Blocks	No's	0.20	0.00	0.00	4.00	0.80	4.00	0.80	4.00	0.80	4.00	0.80	16.00	3.20
	Training to seed producers on seed certification procedures	All Blocks	No's	0.10	0.00	0.00	4.00	0.40	4.00	0.40	4.00	0.40	4.00	0.40	16.00	1.60
	Total					**23.36**		**14.56**		**1.20**		**1.20**		**1.20**		**41.52**

4.6 Animal Husbandry sector

Livestock have been an integral component of India's agricultural and rural economy since time immemorial, supplying energy for crop production in terms of draught power and organic manure, and in turn deriving their own energy requirements from crop byproducts and residues. Livestock are now more valued as source of food and contribute over one-fourth to the agricultural gross domestic product and engage about 9% of the agricultural labour force. The livestock sector has been growing faster than crop sector; however, in recent years, the growth both in livestock production and productivity has decelerated considerably. India's livestock sector is one of the largest in the world. It has 56.7% of world's buffaloes, 12.5% cattle, 20.4% small ruminants, 2.4% camel, 1.4% equine, 1.5% pigs and 3.1% poultry. In 2010-11, livestock generated outputs worth Rs. 2075 billion which comprised 4% of the GDP and 26% of the agricultural GDP. The total output worth was higher than the value of food grains.

Animal Husbandry sector plays a crucial role in ensuring the welfare of rural population. A majority of farmers depend on Animal Husbandry for their livelihood. Moreover, livestock sector provides supplementary employment and sustainable source of income to many small and marginal farmers. Thus, this sector is emerging as an important sector, leveraging the rural economy. In addition, this sector provides a continuous flow of essential food products like milk, meat, eggs besides draught power, raw materials like wool and hides for industries, and manure. With increase in production of livestock products, livestock rearing is also considered as an avocation with high export potential. Distribution of livestock wealth is more egalitarian, compared to land and hence, from the equity and livelihood perspective, it is considered as an important component in poverty alleviation programmes.

Keeping view in this mind, various major interventions are being planned and proposed in the district agricultural plan to be implemented beyond 12th five year plan. The major interventions are:

1. Increasing the availability of fodder through field level interventions are covered in all blocks.
2. Increasing the availability of fodder by strengthening farm infrastructure are covered in all blocks.
3. Livestock breeding management are covered in all blocks.
4. Livestock health is covered in all blocks.
5. Improving the livestock productivity are covered in all blocks except srivaikundam.
6. Improving the service delivery at veterinary institutions are covered in all blocks except pudur block.
7. Enhancing livestock management are covered in all blocks.
8. Capacity building are covered in all blocks.

Increasing the availability of fodder through field level interventions

Livestock rearing is one of the major occupations in India and is making significant contribution to the country's GDP. The livestock population, over the years, has shown a steady growth on broadly two counts i.e. (i) increase in the number of stall feeding based bovine livestock viz. buffaloes and hybrid cattle, and (ii) increase in the number of free grazing based livestock like goats and sheep that can survive on the fast degrading pasturage. The animal husbandry sector has a good growth potential. However, further growth of the sector will be as much dependent upon the availability of fodder. The available data reveals that the present fodder availability in the country is well below requirement. The data also reveals that only about half of the annual fodder requirement is met from the cultivated fodder and crop residues, whereas open grazing and fodder availability from common property resources like forests, pastures, village commons, etc. fulfills the remaining half of the annual fodder requirement. The issue to be taken note of is that it is the open grazing and fodder availability from the common property resources that provides sustenance to a vast majority of households with animal husbandry as the only vocation.

The increasing number of livestock and the changing dynamics of animal husbandry practices require corresponding increase in the type of fodder needed to meet the requirements of these new situations.

1. Establishment of vermicomposting unit are covered in all blocks.
2. Distribution of Azolla trays are covered in all blocks.
3. Fodder plot developments are covered in all blocks.
4. Meikal land developments are covered in all blocks.
5. Distribution of seedlings, sprinklers, grass cutter and raingun to the farmers are covered in all blocks.
6. Development of seed production plots covered in alwarnagari, pudur, thootukudi and udankudi.

Increasing the availability of fodder by strengthening farm infrastructure

The livestock sector is handicapped due to inadequate infrastructure facilities as a result of low productivity. Infrastructure development for animal husbandry is felt essential to provide the desired veterinary services in the interior pockets of the districts so as to enable the livestock owners living in the remote areas can avail the opportunities to consider AH activities as livelihood option and maximize profit through livestock sector. Adequately providing proper infrastructure

and equipment to the veterinary health care institution is necessary for the timely diagnosis and treatment of animal diseases. Further, emphasis has to be laid on optimum utilization of waste land to grow fodder.

Improved infrastructure facilities will provide improved veterinary services contributing to reduction in the incidences of animal diseases thereby increasing the overall productivity of animals. The Rural Veterinary Dispensaries are either functioning from rented premises or in dilapidated buildings. Further, functioning of Veterinary Institutions in the rental buildings do not satisfy the requirement of a typical Veterinary Institution and with a restricted scope for further expansion, these are not ideal infrastructure. This necessitates strengthening the infrastructure of the veterinary institutions to offer better delivery of services and to reshape it into knowledge resource centers where best practices can be disseminated to the farmers. The following infrastructure facilities will strengthen the fodder availability such as

1. Establishment of farm production cover are covered in all blocks.
2. Construction of silo pit and overhead tanks are covered in all blocks.
3. Establishment of feed mixing units are covered in all blocks.
4. Installation of rain gun and sprinklers are covered in all blocks.
5. Procurement of agri inputs are covered in all blocks.

Livestock breeding management

Over the past few decades, imported exotic cow varieties have gain a boost in milk production in Tamil Nadu. Most of the cattle breeds are exotic. These breeds theoretically produce a lot of milk, but are not well-adapted to our conditions. About 69% of Indian cows are owned by the economically poor strata of the society. These folks cannot afford to house these exotic breeds in regulated climate conditions.

The government has significantly mismanaged cow breeding. The average milk yield per animal in India is just 3.2 kgs, compared to a global average of 6.6 kgs. The dairy policy and outlook is highly outdated and needs to be replaced with modern, evidence-based thinking

Livestock industry continues to demonstrate a beneficial impact on rural people by improving their income, employment and consumption and thereby acting as a potential tool in alleviating rural poverty. Artificial insemination (AI) has proven to be very effective for the improvement of the genetic potential of animals for higher production and there is no surprise why today AI is the back bone of all breeding programmes in India. The replacement of unproductive and ageing

animals in the herd and its expansion are very important to maintain the scale of economy of the farm. Augmentation of fertility in repeat breeders and sex-sorted semen are some of the modern scientific tools which have been proposed to be employed for effective breeding management to enhance the livestock fertility and productivity. The following interventions will help to improve livestock breeding management, such as

1. CIDR are covered in all blocks.
2. Establishment and distribution of sex-sorted semen facility are covered in all blocks.
3. Establishment of IVF lab are covered in all blocks.
4. Establishment of LN2 and embryo transfer lab are covered in all blocks.
5. Oestrous synchronization are covered in all blocks.

Livestock health

A large number of infectious and metabolic diseases prevalent in Indian livestock have serious implication for animal productivity, export potential and safety/ quality of livestock products and many of these diseases have zoonotic implications. The current efforts of prevention and control of livestock diseases needs to be strengthened. There is a shortage of veterinary and Para-veterinary manpower and facilities including mechanisms for diagnosis, treatment, tracking and prevention of the diseases. Adequate infrastructure for ensuring bio-security, proper quarantine systems and services to prevent the ingress of diseases across the states and national borders is not available. By providing the following facilities will prevent the above diseases such as

1. Upgradation of vaccine production facilities for bacteria and virus are covered in all blocks.
2. Procurement of vaccines, medicine, diagnostic kit are covered in all blocks.
3. Animal quarantine facility in govt. farm are covered in all blocks.
4. Animal testing facility are covered in all blocks.

Improving the livestock productivity

Although India is a major producer of livestock products the average productivity of livestock is lower compared to world average. Inadequate availability of feed and fodder, insufficient coverage through artificial insemination, low conception rates, non-availability of quality males for breeding, poor management practices, high mortality and morbidity losses due

to diseases, inadequate marketing infrastructure and unorganized marketing are the other major concerns. The intervention have been propose are

1. Distribution of sheep, goat, buffalo, piggery, poultry units are covered in all blocks.
2. Establishment of modern poultry, rabbit, piggery, sheep, goat and bull shed are covered in all blocks.
3. Popularizing quail rearing are covered in all blocks.
4. Integrated farming are covered in all blocks.

Improving the service delivery at veterinary institutions

Veterinary hospitals, dispensaries, Aid Centers, diagnostic laboratories and veterinary manpower already available are much less than what is required. These services would be improved and expanded and will continue to be provided by the state owned facilities with an appropriate system of recovery of cost wherever feasible. Private investment to improve delivery of animal health services including facilities by private veterinary graduates would be encouraged. Mobile veterinary dispensaries with provision for vaccination and facilities to generate awareness of farmers regarding various livestock management issues would be promoted to improve outreach. For companion animals, state governments may consider to extend the veterinary services on full cost recovery basis. To improve the service delivery the below mentioned intervention have been proposed. The intervention have been propose are

1. Deep freezer facility for storage of vaccines and medicines
2. Establishment of infrastructure facilities, disease diagnostic lab, mobile veterinary units, surgical theaters and ambulance facilities.

Enhancing livestock management

The country has rich and diverse genetic resources of livestock in the form of a large number of species, breeds, and strains within a species. India has some of the best breeds of cattle and buffaloes with traits for dairy, draught power and dual purposes, several carpet wool breeds of sheep, highly prolific breeds of goats and adaptive breeds of poultry. Such utility genes and breeds would be identified, conserved and utilized for breeding and research. The focus would be on conservation of indigenous breeds of livestock and poultry. By developing slaughter house, livestock shandy also be helpful to enhancing livestock management. The intervention have been propose are

1. Animal identification and traceability are covered in all blocks.
2. Conservation of indigenous breeds are covered in all blocks.
3. Improvements of livestock shandy are covered in all blocks.
4. Establishment of slaughter house are covered in all blocks.

Capacity building

Educating the farmers about the advanced crop production technologies as well as the techniques will enrich the knowledge of farmers through conduct of trainings and demonstrations to the farmers, youths and young entrepreneurs. On field demonstrations are conducted on fodder production technologies, seed production, poultry farming and sheep farming etc.

Capacity building programme is to strengthen the capacities of farmers, indigenous and local communities, and their organizations and other stakeholders, to manage sustainable biodiversity so as to increase their benefits, and to promote awareness and responsible action, in the form of trainings, demonstrations, exposure visits, etc. To create awareness among the farmers the following trainings and campaigns have to be conducted.

1. Establishment of farmers training Centre are covered in all blocks.
2. Conducting demonstrations camps and campaigns are covered in all blocks.
3. Creating awareness of livestock management to the farmers through training programmes are covered in all blocks.

Budget allocation

The major themes proposed in the plan for animal husbandry sector with a total budget out lay of ₹.3477.25 lakhs**.**

Project implementing agency

The projects proposed will be implemented by the Department of Animal husbandry sector.

Table 4.22. Budget requirement for Animal Husbandry sector in Thoothukudi District

(₹ in Lakhs)

Sl. No	Animal Husbandry	Unit	Unit cost	Blocks covered	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
	Increasing the Availability of Fodder through Field level Interventions															
1	Establishment of Vermicomposting unit (single bed)	Nos	0.05	All Bocks	630	31.50	630	31.50	630	31.50	630	31.50	630	31.50	3150	157.50
2	Distribution of Azolla trays	Nos	0.03	All Blocks	315	9.45	315	9.45	315	9.45	315	9.45	315	9.45	1575	47.25
3	Distribution of Silage bags for conservation of fodder crops	Nos	0.005	All Blocks except B10	80	0.40	80	0.40	80	0.40	80	0.40	80	0.40	400	2.00
4	Fodder plot development	acre	0.05	All blocks	400	20.00	400	20.00	400	20.00	200	10.00	200	10.00	1600	80.00
5	Distribution of Chaff Cutter to farmers	Nos	0.2	All Blocks	59	11.80	59	11.80	59	11.80	59	11.80	59	11.80	295	59.00
6	Distribution of Grass Cutter to farmers	Nos	0.25	All Blocks	103	25.75	103	25.75	103	25.75	103	25.75	103	25.75	515	128.75
7	Developemnt of Seed Production plots	acre	0.25	B1, B6, B7, B11	18	4.50	18	4.50	18	4.50	18	4.50	18	4.50	90	22.50
	Livestock Breeding Management															
8	CIDR (Controlled Internal Drug Release) for increasing Fertility in Cattle	Nos	0.01	All Blocks	240	2.40	240	2.40	240	2.40	240	2.40	240	2.40	1200	12.00
9	Distribution of sex sorted semen to veterinary institution	Nos	0.015	All Blocks	1200	18.00	1200	18.00	1200	18.00	1200	18.00	1200	18.00	6000	90.00
	Improving the Livestock Productivity															
10	Distibution of Sheep/Goat units -semi intensive system	Nos	0.6	All Blocks	109	65.40	109	65.40	109	65.40	109	65.40	109	65.40	545	327.00
11	Distribution of Buffalo units(5 Buffaloes)	Nos	4.5	All Blocks except B9	32	144.00	32	144.00	32	144.00	32	144.00	32	144.00	160	720.00

Sl. No	Animal Husbandry	Unit	Unit cost	Blocks covered	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
12	Integrated farming (Goat+Cattle+Fish+Agri culture /Horticulture)	Unit	2	All Blocks	5	10.00	5	10.00	5	10.00	5	10.00	5	10.00	25	50.00
13	Development of Native chicken farms	Farm	1	All Blocks	25	25.00	25	25.00	25	25.00	25	25.00	25	25.00	125	125.00
14	Establishment of disposal pits for poultry unit	Nos	1	All Blocks	25	25.00	25	25.00	25	25.00	25	25.00	25	25.00	125	125.00
15	Distribution of Piggery units (fattening-5 Nos)	Nos	1.25	B1, B4, B7, B10	21	26.25	21	26.25	21	26.25	21	26.25	21	26.25	105	131.25
	Improving the Service Delivery at Veterinary Institutions															
16	Deep freezer facility for Storage of vaccines and Medicines	Nos	10	All Blocks	0	0.00	0	0.00	12	120.00	0	0.00	0	0.00	12	120.00
17	Establishment of Mobile Disease Diagnostic Labs	Nos	20	B7	1	20.00	0	0.00	0	0.00	0	0.00	0	0.00	1	20.00
18	Establishment of Mobile Veterinary Units	Nos	10	B7	1	10.00	0	0.00	0	0.00	0	0.00	0	0.00	1	10.00
19	Establishment of surgical theatres at veterinary institution	Nos	30	All Blocks	3	90.00	2	60.00	2	60.00	2	60.00	3	90.00	12	360.00
20	Providing solar lighting panels at veterinary institution	Nos	1	All Blocks	5	5.00	1	1.00	1	1.00	2	2.00	6	6.00	15	15.00
21	Package of Modern Veterinary Diagnostic Aids to Veterinary Institutions such as Computerised X rays, Ultrasound, Diathermy etc.	Nos	30	All Blocks	3	90.00	2	60.00	2	60.00	2	60.00	3	90.00	12	360.00
22	Establishment of Ambulance facility for animals	Nos	80	B7	1	80.00	1	80.00	0	0.00	0	0.00	0	0.00	2	160.00

Sl. No	Animal Husbandry	Unit	Unit cost	Blocks covered	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
	Livestock Management															
23	Animal Identification and Traceability	Unit of 1000 animals	0.1	All Blocks	300	30.00	30	3.00	30	3.00	30	3.00	30	3.00	420	42.00
24	Conservation of Indigenous breeds	Pack	10	All Blocks	1	10.00	1	10.00	1	10.00	1	10.00	1	10.00	5	50.00
	Capacity Building															
25	Establishment of Farmers training Centre	Nos	200	B7	0	0.00	1	200.00	0	0.00	0	0.00	0	0.00	1	200.00
26	Conducting Demonstrations, Camps and Campaigns	Nos	0.1	All Blocks	63	6.30	63	6.30	63	6.30	63	6.30	63	6.30	315	31.50
27	Creating awarness of livestock management to the farmers through Training Programmes	Nos	0.1	All Blocks	63	6.30	63	6.30	63	6.30	63	6.30	63	6.30	315	31.50
	Grand Total		**402.51**			**767.05**		**846.05**		**686.05**		**557.05**		**621.05**		**3477.25**

Alwarthirunagari-B1, Karungulam-B2, Kovilpatti-B3, Kayathar-B4, Ottapidaram-B5, Pudur-B6, Thoothukudi-B7, Tiruchendur-B8, Srivaikundam-B9, Sathankulam-B10, Vilathikulam-B11, Udangudi-B12

4.7 Dairy Development sector

The importance of dairying in a country like India hardly needs emphasize. India has vast resources of livestock, which play an important role in the national economy and also in the socioeconomic development of millions of rural households. India has one of the largest stocks of cattle and buffaloes: more than 50 percent of the world's buffaloes and 20 percent of its cattle.

Dairy sector acts as an important source of income for rural families, plays a vital role in providing gainful employment and income generating opportunities in the district. Dairy industry in the country is expected to witness spectacular growth in 2017, according to experts.

During the last 10 years, the annual growth rate in Indian dairy industry is 4.6 per cent as compared to the global growth rate of 2.2 per cent. During this period, per capita consumption of milk in the country was 340 g a day as against 299 g globally. “India’s milk production has touched 155.4 metric tonnes during 2015-16. Consumption is increasing at a faster rate. However in the country more than 90 per cent of the dairying is at the subsistence level so the emerging trends have to increase the county’s milk production moreover. To fulfill the shortage in dairy sector the following interventions have been suggested.

Strengthening of milk storages and processing units

Clean milk production is a concept being used everywhere, where quality of milk has become prime importance. It has to be maintained throughout the milk supply chain right from the dairy farm environment to cooling & storage to its packaging. The machinery and equipment required depends on the level of mechanization desired and the scale of operation. However, some machinery and equipment are essentially required such as storage tanks, washer, coolers, pumps and processing equipment’s. Except for this some electrical installation also required to provide proper storage facilities.

The major interventions are mentioned below are covered in all blocks of thoothukudi districts.

1. Milk storage tanks of various capacities
2. Milk tankers
3. Milk pumps
4. Processing equipment’s
5. Pasteurizers
6. Heaters and chillers

7. Washer and conveyors
8. Pipes and fittings
9. Cleaning equipment's
10. Electrical installations (UPS, generators, stabilizers, control panel)

Enhancing milk production and milk processing units

The quality of animals is critical in determining its milk productivity and hence overall production. Currently, low productivity per animal hinders development of the dairy sector. Despite being the world's largest milk producer, India's productivity per animal is very low, at 987 kg per lactation, compared with the global average of 2038 kg per lactation.

The low productivity is a result of ineffective cattle and buffalo breeding programmes, limited extension and management on dairy enterprise development, traditional feeding practices that are not based on scientific feeding methods, and limited availability and affordability of quality feed and fodder. Animal health and breeding services provision, veterinary infrastructure development and vaccinations are the responsibility of the state government. These services have traditionally been provided for free or at a very subsidized rate but in the past few years it has been payable. state livestock development agencies are being set up as autonomous bodies to offer services in animal breeding in the form of procurement, production and distribution of breeding inputs (such as semen and liquid nitrogen), training and promotional activities. Despite these initiatives, the availability of services remains limited and extension activities in dairy management are woefully lacking. Let to get a better improvement in milk production than before the following inputs have been suggested. The major interventions are mentioned below are covered in all blocks of thoothukudi districts.

1. Provision of veterinary medicine
2. Fodder development equipment and seed material
3. Milk testing equipment's
4. Equipment's for artificial insemination
5. Milk society buildings and cow shed
6. Cryogenic containers
7. Weighing machines
8. Computer accessories

Capacity building

India is the largest milk producer in the world with an annual production of over 155.4 metric tonnes of milk, yet the sector faces numerous issues. One of the major challenges facing the dairy sector is the growing gap between milk supply and demand. Another major challenge arises from the fact that more than 92 percent of the animals are owned by smallholders who had little ownership of land to manage them. The small farmers do not have sufficient resources and lack training in dairy sector that leads to poor animal health and low milk yield. Furthermore, the small farmers lack knowledge of modern breeding practices. To make the farmers as scholars in particular thing some trainings and camps has to be conducted. To make sure this the following intervention has been proposed. The major interventions are mentioned below are covered in all blocks of thoothukudi districts.

1. Training of personnel of MPCS, Union and federation
2. Infertility camps

Marketing structures

Marketing is generally defined as the process of planning and executing the conception, pricing, promotion, and distribution of ideas, goods, and services to create exchanges that satisfy individual and organizational objectives. The word Dairy marketing means where the milk is kept and marketing. Dairy marketing truly came into the public consciousness with the introduction of the “Got milk” campaign in 1993. Marketing plays a vital role not only in stimulating production and consumption, but also in accelerating the pace of economic development. An efficient marketing system minimizes costs, increases returns to farmers by reducing the number of middlemen or by restricting the commission of marketing system. To increase the income in dairy sector the suitable marketing structure is vital. For that the following structures have been suggested. The major interventions are mentioned below are covered in all blocks of thoothukudi districts.

1. Parlour structure
2. Milk product storage cabinets
3. Product billing system

Quality control

Quality is a vital ingredient of a good brand. Remember the “core benefits” – the things consumers expect. These must be delivered well. To ensure the quality of the following interventions have been suggested. The major interventions are mentioned below are covered in all blocks of thoothukudi districts.

1. Adulteration detection equipment’s
2. Milk testing equipment and laboratory

Processing and value addition

While adding value to farm and livestock products before they reach the local and international market is one of the key aims of Vision 2030. Product diversification has become an important aspect of business strategy with reasons for this increased focus being increased profitability, reduction in risk, increasing competition, higher growth and more efficient resource allocation. Value addition in the dairy value chain is still a challenge in our country. Value addition has been hailed as one of the solutions to the perishability challenge of milk by converting it to a more durable form and hence reducing farm losses. But only few of them undertake the value addition In India. To maximize the value addition in rural areas the following interventions have been suggested. The major interventions are mentioned below are covered in all blocks of thoothukudi districts.

Skim milk powder plant

1. Dairy processing plants
2. Water and effluent treatment plants
3. Steam raisning plant
4. Fat handling and other dairy equipment’s

Development for dairy sector

Though the milk production has reached an all-time high in the district, the producers are not able to market the milk produced. This is mainly due to inadequate infrastructure available for procurement, processing of milk and marketing network. Providing proper infrastructure to the veterinary health care institutions is necessary for the timely diagnosis and treatment of animal diseases. An efficient management of cattle will be incomplete without a well-planned and adequate housing of cattle. Good quality milk is essential for production of good quality dairy

products, taste and flavor, free from pathogens and long keeping quality. Immediately after milking, the milk must be cooled preferably to 4° C. This requires mechanical refrigeration or milk cooling tanks. These are expensive and can usually be afforded by large scale commercial farms. For small scale dairy farmers, setting up a milk cooling centre centrally may be the ideal solution. The following buildings have been proposed for better storage and improvement

1. Construction of dairy farm and skim milk powder plant are covered in all blocks of Thoothukudi district.
2. BMC building are covered in all blocks of Thoothukudi district.
3. Cattle feed plants are covered in all blocks of Thoothukudi district.
4. Ware house for dairy products are covered in all blocks of Thoothukudi district.
5. Ice cream manufacturing buildings are covered in all blocks of Thoothukudi district.

Budget allocation

An outlay of Rs.1947.28 lakhs is proposed to fulfill the aforementioned interventions for five years. Out of this, 1500.00 lakhs allocated only for the construction of Dairy for improving the rural dairy sector in Ariyalur District. By constructing dairy unit in rural areas more and more beneficiaries belonging to the weaker sections of the District are baled out of poverty, thus ensuring equitable growth and development. The balance amount of ₹.2888.25 lakhs is going to be used for the enhancement of milk productions and milk processing units such as cow shed, milk societies and for purchase of procurement equipment's. This foresighted implementation of developmental schemes in Dairy Sector has enabled to increase the per capita income of rural households in backward Districts.

Implementing agency

The projects will be implemented by the Department of Dairy Development.

Table 4.23 Budget requirement for Dairy Development sector in Thoothukudi District

(₹ in Lakhs)

Sl. No	Dairy development	Blocks covered	Unit	Unit cost	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
	Engineering section															
1	Electrical installation like Transformer, UPS, Stabilizers, Control Panel MCC etc.,	All blocks	1	25	1	25.00	1	25.00	0	0.00	0	0.00	0	0.00	2	50.00
2	Milk Storage Tanks of various capacities	All blocks	1	15	0	0.00	2	30.00	2	30.00	2	30.00	2	30.00	8	120.00
3	Tub washer, Canwashers, Crate conveyor systems.	All blocks	1	10	0	0.00	0	0.00	0	0.00	1	10.00	1	10.00	2	20.00
4	SS pipes and fittings	All blocks	1	5	1	5.00	1	5.00	1	5.00	1	5.00	1	5.00	5	25.00
5	Solar system for water heating	All blocks	1	2	2	4.00	2	4.00	2	4.00	2	4.00	2	4.00	10	20.00
6	Packing Machineries for milk, Butter, Ghee, SMP and Other Milk products	All blocks	1	18	0	0.00	2	36.00	2	36.00	0	0.00	0	0.00	4	72.00
7	Plate Heat type Chillers and pasteurizers	All blocks	1	10	1	10.00	0	0.00	0	0.00	1	10.00	0	0.00	2	20.00
8	Milk Tankers of various capacities	All blocks	1	25	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
9	Milk Pumps of Vaious capacities	All blocks	1	0.5	5	2.50	5	2.50	5	2.50	5	2.50	5	2.50	25	12.50
10	Generator of various capacities	All blocks	1	20	0	0.00	0	0.00	0	0.00	0	0.00	1	20.00	1	20.00
11	Cleaning In Place equipments with accessories	All blocks	1	75	0	0.00	0	0.00	1	75.00	0	0.00	0	0.00	1	75.00
	Procurement and Input															
12	Veterinary Medicine	All blocks	1	2	2	4.00	2	4.00	2	4.00	2	4.00	2	4.00	10	20.00
13	Two wheeler for AI technician	All blocks	1	0.5	5	2.50	5	2.50	5	2.50	5	2.50	5	2.50	25	12.50

Sl. No	Dairy development	Blocks covered	Unit	Unit cost	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
14	Computer system with accessories	All blocks	1	0.5	5	2.50	5	2.50	5	2.50	5	2.50	5	2.50	25	12.50
15	Fodder seed materials	All blocks	1	0.25	5	1.25	5	1.25	5	1.25	5	1.25	5	1.25	25	6.25
16	Fodder development equipments like chaff cutter, Mower etc.,	All blocks	1	0.2	15	3.00	15	3.00	15	3.00	15	3.00	15	3.00	75	15.00
17	Bulk Milk coolers of Various capacities	All blocks	1	15	2	30.00	2	30.00	2	30.00	2	30.00	2	30.00	10	150.00
18	Milk cans	All blocks	1	0.035	200	7.00	200	7.00	200	7.00	200	7.00	200	7.00	1000	35.00
19	Electronic weighing scales of various capacities.	All blocks	1	0.3	5	1.50	5	1.50	5	1.50	5	1.50	5	1.50	25	7.50
20	Electronic milk testing equipments	All blocks	1	1.25	5	6.25	5	6.25	5	6.25	5	6.25	5	6.25	25	31.25
21	Milking machine	All blocks	1	0.8	5	4.00	5	4.00	5	4.00	5	4.00	5	4.00	25	20.00
22	Cow shed	All blocks	1	5	5	25.00	5	25.00	5	25.00	5	25.00	5	25.00	25	125.00
23	Society Buildings	All blocks	1	20	5	100.00	5	100.00	5	100.00	5	100.00	5	100.00	25	500.00
24	Cryogenic containers	All blocks	1	0.35	5	1.75	5	1.75	5	1.75	5	1.75	5	1.75	25	8.75
25	Equipments for Artificial Insemination	All blocks	1	0.5	5	2.50	5	2.50	5	2.50	5	2.50	5	2.50	25	12.50
	Capacity building															
26	Training of personnel of MPCS, Union and Federation.	All blocks	1	0.05	50	2.50	50	2.50	50	2.50	50	2.50	50	2.50	250	12.50
27	Infertility Camps	All blocks	1	0.2	50	10.00	50	10.00	50	10.00	50	10.00	50	10.00	250	50.00
28	Parlour structures	All blocks	1	5	10	50.00	10	50.00	10	50.00	10	50.00	10	50.00	50	250.00
29	Milk product storage cabinets	All blocks	1	0.3	100	30.00	50	15.00	50	15.00	50	15.00	50	15.00	300	90.00
30	Product Billing systems	All blocks	1	0.3	100	30.00	100	30.00	100	30.00	100	30.00	100	30.00	500	150.00

Sl. No	Dairy development	Blocks covered	Unit	Unit cost	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
	Quality control															
31	Adulteration detection equipments	All blocks	1	4	1	4.00	1	4.00	1	4.00	1	4.00	1	4.00	5	20.00
32	Milk testing equipment and Laboratory.	All blocks	1	5	1	5.00	1	5.00	1	5.00	1	5.00	1	5.00	5	25.00
	Processing	All blocks														
33	Effluement treatment plant	All blocks	1	100	0	0.00	1	100.00	0	0.00	0	0.00	0	0.00	1	100.00
34	Fat handling equipments	All blocks	1	200	0	0.00	0	0.00	1	200.00	0	0.00	0	0.00	1	200.00
35	Dairy equipments	All blocks	1	50	1	50.00	1	50.00	1	50.00	1	50.00	1	50.00	5	250.00
	Civil work Infrastructure															
36	BMC buildings	All blocks	1	15	2	30.00	2	30.00	2	30.00	2	30.00	2	30.00	10	150.00
37	Ware house for Dairy products	All blocks	1	200	0	0.00	1	200.00	0	0.00	0	0.00	0	0.00	1	200.00
	Grand Total					**449.25**		**790.25**		**740.25**		**449.25**		**459.25**		**2888.25**

4.8 Fisheries sector

Fisheries' as a sector is one of the thrust areas in the overall Economic development of the State playing a predominant role in its economic activity by its contribution to direct and indirect employment for more than 11 lakh fishers, contributing food security to a considerable portion of population and earning substantial revenue, especially from foreign exchange. The Fisheries sector over the years has transformed from subsistence-based artisanal activities to modern livelihood activities with the application of science and modern technologies in the field of capture fishing and culture fisheries. It is developing as a major industry with diversifications viz., exploring deep sea resources and eco-friendly aquaculture practices for culture of finfish and shell fish, ornamental fish culture, eco-tourism, fish processing parks, mid sea fish processing units, etc.

I. Enhancement of fisheries production

With increasing pressure on the world's inland and coastal marine fisheries, increases in production and quality of yield are being sought through the application of a range of enhancement techniques. Which of these is applied depends on the attitude to the natural resource by societies at different levels of economic development. The range of enhancement techniques involves increasing levels of human input and control which raise productivity significantly, but which also raise costs. Introductions have raised production in many areas of the world at the price of the risk of environmental disruption. Stocking is extremely widespread but has generally been applied uncritically. A variety of models are proposed to serve as a basis for more rigorous evaluation of biological and economic effectiveness of this practice. Fertilization of water bodies is used to raise levels of production further. Elimination of unwanted species then becomes necessary to maximize benefits from the target species. Adjustments to the habitats within the water body assist in raising general levels of productivity which culminate in the conversion of areas of the water into fish ponds or for cage culture. This process has important implications for the social, economic and policy context which necessitates shifts in ownership, finance and education among populations where these types of development occur**.**

Aquatic plants growing in ponds and lakes are beneficial for fish and wildlife. They provide food, dissolved oxygen, and spawning and nesting habitat for fish and waterfowl. Aquatic plants can trap excessive nutrients and detoxify chemicals. However, dense growths (over 25% of the surface area) of algae and other water plants can seriously interfere with pond recreation and threaten aquatic life. Water plants can restrict swimming, boating, fishing, and other water sports. Biological controls for aquatic vegetation have received considerable publicity. Several species of

fish are herbivorous in that their principal diet is aquatic vegetation. One such species, the grass carp (also known as the white amur or Chinese carp), is being tested in various parts of the country. Hence in this district it is suggested to implement the biological control of aquatic weeds by stocking of Grass Carps in Aquatic Weed Infested water bodies with project cost of ₹ 0.90 lakhs.

In the inland fisheries sector, aquaculture is poised to play a pivotal role in increasing fish production, ensuring food security and enhancing growth of the State's economy. To maximize fish production from an unit area and to generate maximum income to the fish farmers, the Government has initiated innovative approaches such as stocking of fast growing fish species in the short seasonal water bodies, integrating aquaculture in the existing irrigation systems / rain water harvesting systems, brood stock development to produce quality fish fingerlings, promotion of fish culture in farm ponds and introduction of cage culture in reservoirs etc. With concerted efforts to mobilize farmers to adopt fish farming, application of appropriate technologies for sustainable fish farming and fish seed production and availability of institutional finance, it would be possible to bring in substantial hikes in the annual fish production from the aquaculture sector within a span of 5 years. Hence in this district it suggested to implement the following intervention to enhance the production and growth of fisheries with budget cost of ₹ 263.90 lakhs.

The interventions are

1. Biological Control of Aquatic Weeds by Stocking of Grass Carps in Aquatic Weed Infested water bodies of Thoothukudi District (Area in Ha) (500 seeds/ha. @ Rs.4/seed - 100% subsidy) are covered in Alwarnagari, Karungulam, Sathankulam, Srivaikundam and Thoothukudi.
2. Introduction of IMC seeds in riverine check dams and weirs are covered in all blocks except Udankudi.
3. Increasing Fishing Efficiency of Inland Fishermen and Fish Farmers
4. Enhancement of Fish production in irrigation tanks and panchayat tanks by stocking fish seeds are covered in Alwarthirunagiri, Kayathar, Kovilpati, Ottapidaram,Pudur, Srivaikundam, Thoothukudi and Vilatikulam.
5. Cage culture of Cobia and lobster in coastal villages of Thoothukudi District. Promotion of Ornamental fish culture are covered in Sathankulam, Thoothukudi, Udankudi and Tiruchendur blocks.
6. Installation of Artificial Reefs in The Inshore Areas of Thoothukudi Coast are covered in sathankulam, thoothukudi, udankudi and tiruchendur blocks.

7. Promotion of quality fish marketing by traditional fishers by providing moped with ice box are covered in Sathankulam, Thoothukudi, Udankudi and Tiruchendur blocks.
8. Improvement of hygenic fish handling by providing ice boxes are covered in Sathankulam, Thoothukudi, Udankudi and Tiruchendur blocks.

II. Infrastructure and assets

Fish Farming is an age old activity and in practice from ancient times. The successful fish culture requires ploughing of pond, addition of manure, stocking of fish seed; eradication of unwanted aquatic plants and animals, watering the pond; harvesting the crop and marketing of the produce. The fish culture technologies and economics are simple and understandable to the fish farmers. Hence the construction of fish ponds in this district is recommended for its commercial production with budget cost of ₹ 18.75 lakhs

III. Capacity Building

Effective extension support is essential for the promotion of Aquaculture in freshwater and brackish water areas. It is necessary to establish the information centres/data dissemination centres in Fishermen villages, animation camps in fisheries villages, seminars, exhibitions and workshop, and awareness centres for linking the fishing villages, marketing centres and the district offices. Hence in this district it is necessary to give training to fish farmers, organization of fish festival and to fish farmers with budget of cost of ₹ 18.00 lakhs

Budget

The budget requirement for fulfilling the above interventions is ₹ 1950.45 lakhs

Implementing agency

Department of Fisheries will be implementing the project

Table 4.24. Budget requirement for Fisheries sector in Thoothukudi District

(₹ in Lakhs)

Sl. No	Fisheries	Blocks covered	Unit	Unit cost	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
	Enhancement of fisheries															
1	Promotion of quality fish marketing by traditional fishers by providing mobbed with icebox	Sattankulam, Thoothukudi, Tiruchendur, Udangudi	1	0.25	20	5.00	20	5.00	20	5.00	20	5.00	20	5.00	100	25.00
2	Promotion of Ornamental fish culture	All Blocks	1	1.5	12	18.00	12	18.00	12	18.00	12	18.00	12	18.00	60	90.00
3	Introduciton of IMC seeds in riverine check dams and weirs (ha.) (2000 AFL/ha. @Rs.2/seed-100% subsidy)	All Blocks Except Udangudi	1 Ha	0.04	11	0.44	11	0.44	11	0.44	11	0.44	11	0.44	55	2.20
4	Installation of Artificial Reefs in The Inshore Areas of Tamil Nadu Coast (Unit)	Sattankulam, Thoothukudi, Tiruchendur, Udangudi	1	0.25	20	5.00	20	5.00	20	5.00	20	5.00	20	5.00	100	25.00
5	Increasing fishing efficiency of inland fishermen and fish farmers	Srivaikundam, Thoothukudi, Tiruchendur	1	0.075	100	7.50	100	7.50	100	7.50	100	7.50	100	7.50	500	37.50
6	Improvement of hygenic fish handling by providing ice boxes	Sattankulam, Thoothukudi, Tiruchendur,Udangudi	1	0.058	80	4.64	80	4.64	80	4.64	80	4.64	80	4.64	400	23.20
7	Enhancement of Fish production in irrigation tanks and Panchayat tanks by stocking fish seeds	Alwarthirunagari,Kayathar, Kovilpatti, Ottapidaram, Pudur, Srivaikundam, Thoothukudi, Vilathikulam	1 Ha	0.04	8	0.32	8	0.32	8	0.32	8	0.32	8	0.32	40	1.60

Sl. No	Fisheries	Blocks covered	Unit	Unit cost	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
8	Cage Culture of Cobia and Lobster	Sattankulam, Thoothukudi, Tiruchendur,Udangudi	1	2.915	4	11.66	4	11.66	4	11.66	4	11.66	4	11.66	20	58.30
9	Biological Control of Aquatic Weeds by Stocking of Grass Carps in Aquatic Weed Infested water bodies	Alwarthirunagari, Karungulam, Sattankulam, Srivaikundam, Thoothukudi	1 Ha	0.002	90	0.18	90	0.18	90	0.18	90	0.18	90	0.18	450	0.90
	Infrastructure and Assets															
10	Establishment of Farm ponds	Karungulam, Ottapidaram, Thoothukudi	1	0.25	15	3.75	15	3.75	15	3.75	15	3.75	15	3.75	75	18.75
	Capacity building programme															
11	Training to fish farmers	All Blocks	1	0.03	120	3.60	120	3.60	120	3.60	120	3.60	120	3.60	600	18.00
12	Creation of Marine infrastructure facilities for the fisher-folk of coastal towns and villages to enhance Marine fish production, hygienic handling of catch and prevention of Post harvest losses	All Blocks	Nos	550	0	0	0	0	0	0	0	0	3	1650	3	1650.00
	Grand Total					**60.09**		**60.09**		**60.09**		**60.09**		**1710.09**		**1950.45**

B1- Alwarthirunagari, B2- Karungulam, B3- Kayathar, B4- Kovilpatti, B5- Ottapidaram, B6- Pudur, B7- Sattankulam,

B8- Srivaikundam, B9- Thoothukudi, B10- Tiruchendur, B11- Udangudi, B12- Vilathikulam

4.8.1 TNFU Research Infrastructure and Development

Fisheries sector occupies a very important place in the socio-economic development of the country. It has been recognized as a powerful income and employment generator as it stimulates growth of a number of subsidiary industries, and is a source of cheap and nutritious food, besides being a foreign exchange earner. Most importantly, it is the source of livelihood for a large section of economically backward population of the country. In India, fisheries have always been playing a vital role in providing gainful employment to people, besides securing their food and nutritional security, especially in rural areas. India is the third largest producer of inland capture fish in the world after China and Myanmar. Inland fish production in the country registered an impressive growth of 8 fold in the last 50 years. Tamilnadu Fisheries University has proposed the following project to strengthen the research infrastructure and development in this district.

1. Establishment of demonstration unit for intensive raceway and biofloc based larval rearing and lined ponds grow out system for *L.vannamei*at Tharuvaikulam

In the present *L. vannamei*farming scenario, farmers are affected due to diseases like EHP (Enterocytozoon Hepato Penaei) and Running Mortality Syndrome (RMS) due to unknown infections. Due to this, farmers lose their crop within 30 days of stocking. Among these, major problem faced is due to EHP, resulting in slow growth and loss of crop. The affected pond will be continued in occurrence of this disease in the forthcoming crops by the shrimp farming community. Since 100 % elimination of this parasitic infection is not possible in earthen pond, the three phase modular farming system such as hatchery, nursery and grow out system will definitely prevent the risk of this disease.

Water quality assessment and management are indispensable for sustaining shrimp aquaculture. At present, there is no laboratory for fish and shrimp farmers of Tamil Nadu districts to analyze water and soil quality parameters in their aquaculture systems. To maintain the water quality aspects for the better production and to maintain pollution free environment, the fish and shrimp farmers need to have standard water quality laboratory. Similarly, fish farmers are quite often not provided with the much needed information on the suitability of the site and source water for use in aquaculture practices. Maintenance of good water and soil quality will pave way for sustainable aquaculture. Hydrological parameters in aquaculture systems at optimum levels would not only enhance survival, growth and production, but would also avoid occurrence of disease problems. The components required to implement this project is as follows,

- Vehicle for seed and feed Transportation
- Paddle Wheel Aerators
- Submersible wires and starters
- Air Compressor
- Filtration units
- Generator (100 KV)
- Twin Screw Extruder
- Automatic Kjeltech Nitrogen Analyzer
- Automatic Fibretech Analyzer
- Automatic Fat Analyzer
- Furniture's for trainees hostel
- Water quality analysis test kits
- Portable data analyzer (Lap Top) and Printer

The following infrastructure facilities is required to implement this project.

- Construction of Raceway Unit with shed
- Construction of circular cement tank
- Construction of Effluent Treatment Pond (ETP)
- with drainage system
- Construction of Trainees hostel
- Ground Floor 5 rooms
- First Floor 5 rooms
- Construction of common rest room for ladies and gents
- Raceway renovation with epoxy lining
- Renovation of grow out existing damaged lined pond
- with new HDPE lining sheet
- Pump House renovation with new pumps and laying of new water intake system
- Renovation of the existing facilities
- Training hall
- Live feed lab
- Microbiology lab

2. Proposal on "Establishment of Fish Processing Technology Business Incubation Centre" (FPTBIC)

Fishery is the prime most economic activity in the southern districts of Tamil Nadu. The major fishery includes emperors,seer fish, groupers, tuna, snappers, goat fishes, anchovies etc. that fetch good price for fishermen. Besides these, huge quantities of low value fishes like lesser sardines, oil sardines, sciaenids, skipjack tuna, leather jacket, silver bellies, lizard fishes, cat fishes etc., are also landed but are not effectively utilized and predominantly shifted for fish meal or dry fish market. Fisher women and self help groups are largely involved in these activities contributing to a meagre income source for livelihood. These low value fishes can be effectively used for the preparation of value added fishery products which can provide them better employment opportunities and income. Fish protein is rich in all essential amino acids irrespective of size of the fish. Small varieties of fishes are not relished because of pin bones, and are generally converted into meal for animal feed it is were to use the high quality protein for human consumption by conversion into value added fishery products in various convenient forms.

Hence, establishment of a "Fish Processing Technology Business Incubation Centre" (FPTBIC) at the Fisheries College & Research Institute campus of Thoothukudi shall enable them to take up the venture successfully which shall later promote them to have their own self employment. This facility shall also be used for providing vocational training programmes, skill development programmes and certificate courses for the interested entrepreneurs to take up employment and to produce skilled man power for fish processing industries. The establishment of "Fish Processing Technology business incubation Centre" (FPTBIC) will strengthen the concept of creating fish Processing parks at regional levels. This facility will help to promote fish processing activities at Thoothukudi and nearby districts by small scale entrepreneur to cater to the domestic needs. The components required to implement this project are,

- Twin screw extruder
- Automatic form fill and packing machine with steam jacketed kettle
- Generator set
- Form and fill Machine
- Thermocouple assembly
- Automatic coding machine
- Flake ice unit
- Vacuum sealing machine
- Modular kitchen and demonstration platform

- Carton strapping machine
- Ultra freezer
- Bottle sealing machine
- Continuous heat bond sealing machine
- S.S. Processing Tables
- Storage cabinet (steel racks & cupboards)
- Refrigerators
- Multipurpose grinder
- S.S.Utensils
- Air curtain
- Pesto flash
- Remote sensing hand washer
- Insulated containers
- Steam cooking system
- Poly bag sealing machine
- Deep freezer
- Closed circuit TV system
- Fresh water treatment unit
- Repairing of Deskinner and Debonner
- Retort pouch pressure testing machine
- Weighing scales
- First floor of existing vocational training centre of DFPT

3. Accredited Microbial Quality Testing Laboratory for Certification of Aquatic Food Products in South Tamil Nadu

In India, the aquatic food export has emerged as the single largest group in agricultural exports accounting for 20%, with the trade crossing over one million tons in 2014-15. India has a potential to cross Rs. 60,000 crore seafood export turnover by 2020 (Kisan Updates, 2016). Many large buyers from the EU, Japan and USA are now looking at India as a stable and reliable supplier of seafood. With the continual growth in marine products export, there are innumerable instances of Indian fishery consignments being rejected by USA, EU and Japan, with quite a large number of rejections due to the presence of pathogenic microbes. On certain occasions, the EU has banned import of Indian fishery products and the US has issued Red Alert for our products.

The total number of seafood consignment rejections recorded during 2015 was 43. The major causes of rejections are mainly filth (33%), microbial pathogens (23%), other causes (39%) and chemical (5%) agents. Considering the chemical risks associated with seafood particularly the antibiotic residues in farmed shrimps, NADP have sanctioned funds for the establishment of a "Chemical residue monitoring laboratory for fish in Tamil Nadu" to TNFU at a cost of Rs.1.4 crore in 2012-13 and the said laboratory is functional in the Dept. of Fish Quality Assurance and Management (DFQAM) of the Fisheries College and Research Institute at Thoothukudi.

One of the major risks associated with the fish products is microbiological, as many seafood associated infections and outbreaks are recorded due to pathogenic bacteria, viruses and parasites. The USFDA has only five categories that specify microbial causes for rejection – *Salmonella, Listeria monocytogenes, Shigella*, Hepatitis A virus and the general bacteria. The incidence of *Salmonella* increased from the fish products from Asia. Recently, South Africa had rejected consignments of seafood exported from South Tamil Nadu due to the presence of *Vibrio* spp. such as *Vibrio parahaemolyticus, V. vulnificus, V. mimicus*and *V. alginolyticus.* So, the maintenance of microbial quality of aquatic food products is one of the greatest challenges in seafood trade as consumer safety. The increase in the number of rejections over the period is also a matter of concern. The frequent rejections not only lead to the economic loss but also tarnish the reputation of our country globally.

Presence of microbial agents in aquatic food products emphasis the poor sanitary issues, which need to be addressed through construction of adequate infrastructure, awareness on hygienic handling and processing as well as stringent enforcement of the regulations to adhere to safety standard. To add on, research studies carried out by the Indian scientists also indicated the occurrence of several bacterial and viral pathogens associated with fish products and the possible health risks. This, it becomes essential to establish an accredited microbial quality testing laboratory exclusively for fish products and to issue certification for promotion of safe fish trade. The components required to implement this project are Civil works, Lab furniture's and Interiors Equipments.

4. Guided increase of aquaculture produce through networked disease surveillance and health certification of cultured fish and shellfish in Tamil Nadu

Indian aquaculture has been growing considerably over the last two decades. There is substantial potential to improve its productivity, diversification of the species, optimum system

management and sustainable disease free aquaculture development. In Tamil Nadu, the development of fisheries and aquaculture has seen very rapid growth in the last one decade. Due to several factors including varied agro-climatic parameters and anthropogenic incursions, the freshwater and marine cultivable fish and shellfish are prone to disease problems in aquaculture systems and several disease problems are being reported from the fish and shrimp farms of the State. As the data is fragmented and unrecorded in many instances, there is an imperative need to put the entire aquaculture activities in the State under continuous surveillance, detecting emergence of epizootics and new diseases. A record of our aquaculture activities and the incidence of diseases and its management measures through treatment and prophylactics has to be documented as a prime requirement for the export of many the fish and shrimp products according to the WTA guidelines.

TNFU has developed the expertise and basic infrastructure to investigate the fish and shellfish disease diagnosis and remedial measures, over the last one and half decades, at Fisheries College and Research Institute, Thoothukudi and disease diagnostic laboratories at Madhavaram and Nagapattinam. These laboratories would serve as the backbone of the current proposal to bring the entire state under a network platform development. Fisheries College and Research Institute, Thoothukudi of Tamil Nadu Fisheries University has been a participating centre in the National Surveillance programme for Aquatic Animal Diseases. This national programme is covering only select districts of Tamil Nadu and we are now getting consistent queries from among the fish and shellfish farmers across the state for the diagnosis of infections in the aquaculture systems.

In the light of the above, Tamil Nadu Fisheries University propose to set up a State level network platform of aquaculture farms to record the disease incidence for an effective surveillance system with the establishment of three laboratories spread across South, Central and North Tamil Nadu. These laboratories would target and cater to the entire State by forming three clusters of districts according to their geographic distribution. The present proposal is therefore submitted for strengthening the existing infrastructure for achieving this aim as the University is blessed with the required personnel and expertise to meet this objective. The components required to implement this project are

- Civil works- Immunodiagnostic and molecular diagnostic lab
- Wet Laboratory
- Cubicle partition, lab Furniture, Air conditioners,

- Field Utility Vehicle
- Equipment
- Kits, chemicals, glass wares and Plastic wares and AMC for equipments

Overall budget

The projects on infrastructure, research and development will be implemented with a budget out lay of ₹.9329.83 lakhs**.**

Project implementing agency

The projects will be implemented by Tamil Nadu Fisheries University in the various colleges and research stations.

Project outcome

The creation of infrastructure will enhance the quality of the research and it paves way for the state-of-art for the young researchers. The research and developmental activities is a continuous process, the innovative ideas that emerges from the young minds will help in identifying solutions to the field problem.

Table 4.25 Budget outlay for fisheries research and development in Thoothukudi District

(₹. in Lakhs)

Sl. No	Interventions	Unit cost	Blocks Covered	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
				Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
1	**Aquaculture**														
	Inland Aquaculture														
	Brood stock development through hormonal manipulation	250	Thoothukudi	1	250.00	0	0.00	0	0.00	0	0.00	0	0.00	1	250.00
	Mariculture														
	Establishment of demonstration unit for intensive raceway and biofloc based larval rearing and lined pond based grow out system for L.vannamei at Tharuvaikulam	372.4	Thoothukudi	0	0.00	1	372.40	0	0.00	0	0.00	0	0.00	1	372.40
	Aquatic animal health and management														
	Mobile aquaclinics for water quality analysis and disease diagnosis	100	Thoothukudi	0	0.00	1	100.00	0	0.00	0	0.00	0	0.00	1	100.00
2	**Harvest and Post harvest**														
	fish processing technology														

Sl. No	Interventions	Unit cost	Blocks Covered	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
				Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
	Fish processing novel technologies and techniques														
	Modernization of dry fish production through solar driver	100	Thoothukudi	1	100.00	1	100.00	1	100.00	1	100.00	1	100.00	5	500.00
3	**Value addition and fish product diversification**														
	Development of snack foods from fish	100	Thoothukudi	0	0.00	0	0.00	1	100.00	0	0.00	0	0.00	1	100.00
	Promotion of consumption of farmed Tilapia through product development and diversification	100	Thoothukudi	0	0.00	0	0.00	0	0.00	1	100.00	0	0.00	1	100.00
	Development of ready to eat products from farmed freshwater fishes	100	Thoothukudi	0	0.00	1	100.00	0	0.00	0	0.00	0	0.00	1	100.00
4	**Branding of fish products and institutional marketing**														
	Creation of regional production centers for fishery products with state Brand	500	Thoothukudi	0	0.00	1	500.00	0	0.00	0	0.00	0	0.00	1	500.00

Sl. No	Interventions	Unit cost	Blocks Covered	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
				Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
5	**Reduction of post harvest losses**														
	Awareness to fishers on hygienic handling of fish	0.005	Thoothukudi	133	0.67	133	0.67	133	0.67	133	0.67	133	0.67	665	3.33
	Creation of awareness among fishers on fish processing technologies	0.6	Thoothukudi	25	15.00	25	15.00	25	15.00	25	15.00	25	15.00	125	75.00
	Capacity building and skill development programmes on fish processing technologies	6.6	Thoothukudi	13	85.80	13	85.80	13	85.80	13	85.80	13	85.80	65	429.00
6	**Enhancement of per capita consumption of fish**														
	Awareness campaign on health beneficial attributes of fish	0.005	Thoothukudi	52	0.26	52	0.26	52	0.26	52	0.26	52	0.26	260	1.30
	Production of short films on nutritive value of fish and screening in theatres and television channels	50	Thoothukudi	0	0.00	0	0.00	1	50.00	0	0.00	0	0.00	1	50.00
7	**Utilization of seaweeds and other marine resources for food security**														
	Development of	50	Thoothukudi	0	0.00	1	50.00	0	0.00	0	0.00	0	0.00	1	50.00

Sl. No	Interventions	Unit cost	Blocks Covered	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
				Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
	neutraceutical products form seaweeds														
	Popularization of seaweed products through mass media	0.005	Thoothukudi	400	2.00	400	2.00	400	2.00	400	2.00	400	2.00	2000	10.00
	Development of seaweed snack foods	50	Thoothukudi	1	50.00	0	0.00	0	0.00	0	0.00	0	0.00	1	50.00
8	**Ensuring nutritional security through fish and fishery products**														
	supply of preserved ready to eat and ready to cook fish products through public distribution sytems	12.9	Thoothukudi	0	0.00	1	12.90	0	0.00	0	0.00	0	0.00	1	12.90
	Supply of fish and fish products in mid day meal programme	12.9	Thoothukudi	0	0.00	1	12.90	0	0.00	0	0.00	0	0.00	1	12.90
	Supply chain management to promote consumption of farmed freshwater fishes	64.5	Thoothukudi	0	0.00	1	64.50	0	0.00	0	0.00	0	0.00	1	64.50
9	**Enforcement of international quality standards in fishery products meant for dosmetic market**														

Sl. No	Interventions	Unit cost	Blocks Covered	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
				Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
	Creation of laboratory facility at regional level for testing and certification of fish and fishery products	1000	Thoothukudi	1	1000.00	0	0.00	0	0.00	0	0.00	0	0.00	1	1000.00
	Establishment of sea food forensic laboratory to ensure supply of quality products to domestic and international market	800	Thoothukudi	1	800.00	0	0.00	0	0.00	0	0.00	0	0.00	1	800.00
	Establishment of Aquatic Food Safety Analytical Center	500	Thoothukudi	1	500.00	0	0.00	0	0.00	0	0.00	0	0.00	1	500.00
	Accredited Microbial Quality Testing Laboratory for Certification of Aquatic Food Products in South Tamil Nadu	1000	Thoothukudi	1	1000.00	0	0.00	0	0.00	0	0.00	0	0.00	1	1000.00
10	**Utilization of fish processing waste and by catch**														
	installation of waste rendering plant at selected fishing harbors and fish markets	130	Thoothukudi	0	0.00	1	130.00	0	0.00	0	0.00	0	0.00	1	130.00

Sl. No	Interventions	Unit cost	Blocks Covered	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
				Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
	Development of fish compost for production of organic agricultural and horticultural crops	65	Thoothukudi	0	0.00	1	65.00	0	0.00	0	0.00	0	0.00	1	65.00
	Installation of unit for biogas from fish waste	161.5	Thoothukudi	0	0.00	1	161.50	0	0.00	0	0.00	0	0.00	1	161.50
	Development of technologies for effective utilization of shrimp shell waste	100	Thoothukudi	0	0.00	1	100.00	0	0.00	0	0.00	0	0.00	1	100.00
	Development of peptides from fish processing wastes as dietary supplement	100	Thoothukudi	0	0.00	1	100.00	0	0.00	0	0.00	0	0.00	1	100.00
11	**fishing technology**														
	Establishment of ship in campus facilty to impart training on deep sea fishing technique to the fishermen of Tamil Nadu	600	Thoothukudi	1	600.00	0	0.00	0	0.00	0	0.00	0	0.00	1	600.00
	Establishment of artificial fish bait development laboratory to conserve forage fish stock along the coast of Tamil Nadu due to	500	Thoothukudi	0	0.00	0	0.00	1	500.00	0	0.00	0	0.00	1	500.00

Sl. No	Interventions	Unit cost	Blocks Covered	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
				Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
	longlining														
12	**Fish resource management and conservation**														
	State Apex fisheries biodiversity reference centre for reseource conservation	400	Thoothukudi	1	400.00	0	0.00	0	0.00	0	0.00	0	0.00	1	400.00
	Indigenous fisheries reseource conservation centres														
	GIS centre for aquatic resource and management	500	Thoothukudi	0	0.00	0	0.00	1	500.00	0	0.00	0	0.00	1	500.00
13	**Fisheries Engineering**														
	Aquacultural engineering														
	Farm implements														
	Deisgn and development of e interface gadgets for sustainable aquaculture	20	Thoothukudi	0	0.00	1	20.00	0	0.00	0	0.00	0	0.00	1	20.00
	Harvestors														
	Deisgn and development of shrimp harvester	25	Thoothukudi	1	25.00	0	0.00	0	0.00	0	0.00	0	0.00	1	25.00
	Automation														

Sl. No	Interventions	Unit cost	Blocks Covered	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
				Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
	technologies														
	Developnment of mobile gadgets/apps for remote monitoring system for aquaculture farms	15	Thoothukudi	0	0.00	0	0.00	0	0.00	1	15.00	0	0.00	1	15.00
	Feeding technologies														
	Design and development of effective feeders for aquaculture	35	Thoothukudi	1	35.00	0	0.00	0	0.00	0	0.00	0	0.00	1	35.00
	Navigation and Fisheries Engineering														
	Development of cost effective gadgets for effective fishing	15	Thoothukudi	0	0.00	1	15.00	0	0.00	0	0.00	0	0.00	1	15.00
	Development of mobile apps for effective fishing	8	Thoothukudi	0	0.00	0	0.00	0	0.00	1	8.00	0	0.00	1	8.00
	Post-harvest fisheries engg														
	Handling, transportation and storage														
	Design and development of handling devices/machines for	50	Thoothukudi	0	0.00	1	50.00	0	0.00	0	0.00	0	0.00	1	50.00

Sl. No	Interventions	Unit cost	Blocks Covered	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
				Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
	fish processing														
	Design and development of solar powered tricycle for fish vendors	2	Thoothukudi	1	2.00	1	2.00	0	0.00	1	2.00	1	2.00	4	8.00
	Deisgn and development of cost effective packaging technologies for fish processing	6	Thoothukudi	0	0.00	1	6.00	0	0.00	0	0.00	0	0.00	1	6.00
	Processing machines														
	Design and development of shrimp processing machines	15	Thoothukudi	1	15.00	1	15.00	1	15.00	1	15.00	1	15.00	5	75.00
	Design and development of freshwater fish processing machines	20	Thoothukudi	1	20.00	1	20.00	1	20.00	1	20.00	1	20.00	5	100.00
	Design and development of gadgets for fish processing	20	Thoothukudi	0	0.00	0	0.00	1	20.00	0	0.00	0	0.00	1	20.00
	Technologies development for preservation of fish and value added fish products	15	Thoothukudi	1	15.00	0	0.00	0	0.00	0	0.00	0	0.00	1	15.00

Sl. No	Interventions	Unit cost	Blocks Covered	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
				Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
	Waste utilization technologies														
	Design and development of waste utilization centre	85	Thoothukudi	0	0.00	1	85.00	0	0.00	0	0.00	0	0.00	1	85.00
	Design and development of energy harvesting mechanisms from sea materials	65	Thoothukudi	0	0.00	0	0.00	0	0.00	1	65.00	0	0.00	1	65.00
	Design and development of nanotechnological applications for fisheries engineering	85	Thoothukudi	0	0.00	0	0.00	1	85.00	0	0.00	0	0.00	1	85.00
	Incubation centres														
	Esablishment of incubation centre for extruded products	65	Thoothukudi	1	65.00	0	0.00	0	0.00	0	0.00	0	0.00	1	65.00
	Grand total				**4980.73**		**2185.93**		**1493.73**		**428.73**		**240.73**		**9329.83**

4.9 Public Works Department

Public works department is a premier agency of the state government operating throughout the state for construction of works in Roads, Bridges, Buildings, maintenance and repairs of works and construction of works of other departments of the state government and centrally sponsored schemes. The main function of public works department is designing, construction and maintenance of roads and bridges, residential and non-residential building of state government, construction of national highway, construction of roads financed from NABARD, RIDF, CRF and construction of various works on Airport and Air landing ground.

With the declining and erratic rainfall, it has become necessary to go in for *in situ* water conservation. Further the loss of top soil through erosion needs to be controlled to maintain the soil fertility. The reduction of water storage facilities and the conversion of water bodies for non-agricultural purposes result in the rainwater run-off. The *in situ* water conservation will help in reducing the water and soil erosion and also improve the ground water recharge which is the need of the day. Hence, to raise the water table level, construction of check dams, need to be taken up in canals to increase the storage capacity of the tanks and there by crop cultivation area in tank ayacut area may be increased. Thus the main objective of Public works department in this district is to construct checkdam and Anicut across the river in order to increase the ground water level.

Project components

1. Diverting surplus flood water from Tamirabarani River to recharge Sawyerpuramteri area and to feed series of big tanks up to Korampallam by increasing the carrying capcity of existing Marudur Keelakkal Channel, Perur bye pass channel and excavation of New canal in Thoothukudi District are covered in Srivaikundam and Thoothukudi blocks.
2. Construction of Check Dam across Tamirabarani River in Alwarthirunagari Village in Tiruchendur Taluk of Thoothukudi District
3. Construction of Tail end regulators across Tamirabarani river in confluence points of coastal villages in Thoothukudi District are covered in Alwarnagari block.
4. Constructions of Check Dam across Uppodai in Savalaperi Village in Kovilpatti Taluk of Thoothukudi District are covered in Tiruchendur.
5. Constructions of Check Dam across Uppodai in Chidambarampatti Village in Kovilpatti Taluk of Thoothukudi District are covered in Kayathar block.
6. Construction of Check Dam across Uppodai in Avudaiyammalpuram Village in Kovilpatti Taluk of Thoothukudi District is covered in Thoothukudi block.

7. Construction of Check Dam across Malattar Odai in VadakkuVandalam Village in Kovilpatti Taluk of Thoothukudi District are covered in Ottapidaram block
8. Construction of Check Dam across Malattar Odai in Aathikkinar Village in Etayapuram Taluk of Thoothukudi District are covered in Ottapidaram block.
9. Excavation of New canal from Malattar Odai to Aathikkinar tank in Kovilpatti and Ettayapuram Taluks of Thoothukudi District are covered in Kayathar block
10. Constructions of check dam across NalliUppodai in Avalnatham Village in Kovilpatti Taluk of Thoothukudi District are covered in Kovilpati block.
11. Constructions of Checkdam across Uppodai near Vallinayagipuram village in Kovilpatti taluk in Thoothukudi District are covered in Vilatikulam block.
12. Construction of Checkdam across Chekkarakudi odai in Ramasamiyapuram village in Thoothukudi taluk of Thoothukudi district are covered in Thoothukudi block
13. Construction of Checkdam across Kombadi odai in Kombadi hamlet of Savarimangalam village in Ottapidaram taluk in Thoothukudi District are covered in Ottapidaram block
14. Excavation of supply channel from uppar odai near Malaippatti village to feed Ottapidaram big Tank in Ottapidaram Thoothukudi District are covered in Ottapidaram block
15. Excavation of Supply channel and Formation of New tank in Chettiyapathu Village in Tiruchendur Taluk of Thoothukudi District are covered in Udankudi block.
16. Construction of Checkdam Checkdam across odai in Surangudi village in Vilathikulam taluk in Thoothukudi District are covered in Vilatikulam block.

Budget

The budget requirement for fulfilling the above interventions is ₹.30027.30 lakhs

Expected outcome

The project will increase the Ground water table level and carrying capacity of canals during the heavy rain period and thereby increasing the crop cultivation area. This will result in the ensuring of food security for the people.

Implementing agency

Department of Public Works will be implementing the project

Table 4.26. Budget requirement for Public Works Department in Thoothukudi District

(₹ in Lakhs)

Sl. No	Name of Scheme	Block Covered	Unit	Unit cost	2017-2018		2018-2019		2019-2020		2020-2021		2021-2022		Total	
					Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.
1.	Diverting surplus flood water from Tamirabarani River to recharge Sawyerpuramteri area and to feed series of big tanks up to Korampallam by increasing the carrying capcity of existing MarudurKeelakkal Channel, Perur bye pass channel and excavation of New canal in Thoothukudi District.	Srivai Kundam/ Thoothukudi/ Thoothukudi	Ha	13.30	501.9	6673.3	501.91	6674.0	501.91	6676.00	0.00	0.00	0.00	0.00	1506	20023.3
2	Construction of Check Dam across Tamirabarani River in Alwarthirunagari Village in Tiruchendur Taluk of Thoothukudi District	Alwarthirunagari	Ha	25.25	61.0	1540.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	61	1540.0
3	Construction of Tail end regulators across Tamirabarani river in confluence points of coastal villages in Thoothukudi District.	Thiruchendur	No	1250.00	1.0	1250.0	1.00	1250.00	1.00	1250.00	1.00	1250.00	0.00	0.00	4	5000.0
4	Construction of Check Dam across Uppodai in Savalaperi Village in Kovilpatti Taluk of Thoothukudi District	Kayathar	Ha	0.88	0.00	0.00	228	200.00	0.00	0.00	0.00	0.00	0.00	0.00	228	200.0
5	Construction of Check Dam across Uppodai in ChidambarampattiVillage in Kovilpatti Taluk of Thoothukudi Dt	Kayathar	Ha	1.19	0.00	0.00	92	110.00	0.00	0.00	0.00	0.00	0.00	0.00	92	110.0
6	Construction of Check Dam across Uppodai in Avudaiyammalpuram Village in Kovilpatti Taluk of Thoothukudi District	Kayathar	Ha	0.96	0.00	0.00	94	90.00	0.00	0.00	0.00	0.00	0.00	0.00	94	90.0

Sl. No	Name of Scheme	Block Covered	Unit	Unit cost	2017-2018		2018-2019		2019-2020		2020-2021		2021-2022		Total	
					Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.
7	Construction of Check Dam across Malattar Odai in VadakkuVandalam Village in Kovilpatti Taluk of Thoothukudi District	Kayathar	Ha	4.03	0.00	0.00	75.25	303.00	0.00	0.00	0.00	0.00	0.00	0.00	75	303.0
8	Construction of Check Dam across Malattar Odai in Aathikkinar Village in Etayapuram Taluk of Thoothukudi District	Kayathar	Ha	10.31	0.00	0.00	0.00	0.00	32.0	330.00	0.00	0.00	0.00	0.00	32	330.0
9	Excavation of New canalfromMalattar Odai to Aathikkinar tank in Kovilpatti and EttayapuramTaluks of Thoothukudi District.	Kayathar	Ha	1.28	0.00	0.00	0.00	0.00	129.0	165.00	0.00	0.00	0.00	0.00	129	165.0
10	Construction of check dam across NalliUppodai in Avalnatham Village in Kovilpatti Taluk of Thoothukudi District	Kovilpatti	Ha	7.21	0.00	0.00	0.00	0.00	14.6	105.00	0.00	0.00	0.00	0.00	15	105.0
11	Construction of Checkdam across Uppodai near Vallinayagipuram village in Kovilpatti taluk in Thoothukudi District	Kovilpatti	Ha	4.29	0.00	0.00	0.00	0.00	21.00	90.00	0.00	0.00	0.00	0.00	21	90.0
12	Construction of Checkdam across Chekkarakudi odai in Ramasamiyapuram village in Thoothukudi taluk of Thoothukudi district.	Thoothukudi	Ha	13.62	0.00	0.00	0.00	0.00	0.00	0.00	15.78	215.00	0.00	0.00	16	215.0
13	Construction of Checkdam across Kombadi odai in Kombadi hamlet of Savarimangalam village in Ottapidaram taluk in Thoothukudi District	Ottapidaram	Ha	5.64	0.00	0.00	0.00	0.00	0.00	0.00	21.85	123.30	0.00	0.00	22	123.3
14	Excvation of supply channel from uppar odai near Malaippatti village to feed Ottapidaram big	Ottapidaram	Ha	5.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100	540.00	100	540.0

Sl. No	Name of Scheme	Block Covered	Unit	Unit cost	2017-2018		2018-2019		2019-2020		2020-2021		2021-2022		Total	
					Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.
	Tank in Ottapidaram Thoothukudi District															
15	Excavation of Supply channel and Formation of New tank in Chettiyapathu Village in Tiruchendur Taluk of Thoothukudi District	Udankudi	Ha	5.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	202	1123.00	202	1123.0
16	Construction of Checkdam Checkdam across odai in Surangudi village in Vilathikulam taluk in Thoothukudi District	Vilathi kulam	Ha	4.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	18	73.00	18	73.00
	Total					**9463.33**		**8626.33**		**8613.33**		**1588.30**		**1736.00**		**30027.30**

4.10.Cooperatives

Agricultural cooperatives or farmers' cooperatives are cooperatives where farmers pool their resources for mutual economic benefit. Agricultural cooperatives are broadly divided into agricultural service cooperatives, which provide various services to their individual farming members, and agricultural production cooperatives, where production resources such as land or machinery are pooled and members farm jointly. Agricultural supply cooperatives aggregate purchases, storage, and distribution of farm inputs for their members. By taking advantage of volume discounts and utilizing other economies of scale, supply cooperatives bring down members' costs. Supply cooperatives may provide seeds, fertilizers, chemicals, fuel, and farm machinery. Some supply cooperatives also operate machinery pools that provide mechanical field services (*e.g.,* ploughing, harvesting) to their members. Agricultural marketing cooperatives are often formed to promote specific commodities.

Major components

- Construction of godown keeper office in Kovilpati block.
- Renovation of Staff Quarters in Conoor,Kotagiri and Udhagai
- Construction of compound wall in all blocks in all blocks.
- Office Building Renovation in all the blocks
- Construction of Godown in Thootukudi blocks,Godown Renovation in Karungulam, Kovilpati, Sattankulam, Srivaikundam, ThoothukudiUdangudi, Vilathikulam blocks.
- Strengthening of co-operative structure in all blocks

Budget

The budget requirement for fulfilling the above interventions is **₹ 689.80 Lakhs**

Expected outcome

Agricultural marketing cooperatives will provide the services involved in moving a product from the point of production to the point of consumption. Agricultural marketing includes a series of interconnected activities involving planning production, growing and harvesting, grading, packing, transport, storage, food processing, distribution and sale.

Implementing agency

Department of Cooperative Societies will be implementing the project.

Table. 4.27 Budget estimate for Co- operation

(Rs.in lakhs)

Sl. No	Name of Scheme	Block Covered	2017-2018		2018-2019		2019-2020		2020-2021		2021-2022		Total	
			Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.
1	Construction of Compound wall	All blocks except B1,B11	9	56.50	10	55.50	5	23.50	9	39.00	7	36.00	40	210.50
2	Construction of Godown	B9	1	26.00	0	0.00	0	0.00	0	0.00	0	0.00	1	26.00
3	Construction of Godown Keepers Office	B4	0	0.00	0	0.00	0	0.00	1	8.00	0	0.00	1	8.00
4	Construction of Office Building	B2,B7,B4,B6,B8,B9,B11,B12	5	80.00	6	67.00	8	70.00	0	0.00	0	0.00	19	217.00
5	Renovation of Godown	B2,B4,B8, B9,B11,B12	1	8.80	2	13.00	1	10.00	5	95.50	4	73.00	13	200.30
6	Strengthening of Cooperation Centres (Furniture's, Solar panel, Modern counter, Xerox machine, Air Conditioner, CCTV Camera, Bore well, Generator, UPS Battery, Cash Counting Machine, Invertor, Jewel Weighing Machine, Packing Machine, Purchase of computer and peripherals, Hand Billing machine, LED Display for tender process, Purchase of Jewel Carat Meter, Smart Card Printing Machine, Burglary Alarm, Agricultural Equipments, Safety Locker, Purchase of Display racks, Defender Door, Purchase of Paddy drying machine, Automatic Printer machine, Conveyer, E-Tender process, Fork Lifter, Gunny Bag Stitching machine, Jewel tester, Pallets, Tarpaulin, Trolley and Printing Press machineries**)**	All Blocks	1	28.00	0	0.00	0	0.00	0	0.00	0	0.00	1	28.00
	Total			**199.30**		**135.50**		**103.50**		**142.50**		**109.00**		**689.80**

Table 4.28. Budget Abstract for Thoothukudi District

(₹. in lakhs)

Sl. No	Sectors	2017-18	2018-19	2019-20	2020-21	2021-22	Total
1	Agriculture	3259.80	7540.82	3974.47	4558.18	4341.15	23674.42
2	Agricultural Research (TNAU)	496.00	320.00	120.00	10.00	20.00	966.00
3	Horticulture	1395.71	1368.15	1492.25	1565.52	1589.24	7410.87
4	Agricultural Engineering	969.27	1141.42	1088.90	1442.36	1369.06	6011.01
5	Agricultural Marketing	2789.14	671.44	309.90	229.04	257.00	4256.52
6	Seed Certification and Organic Certification	23.36	14.56	1.20	1.20	1.20	41.52
7	Animal Husbandry	767.05	846.05	686.05	557.05	621.05	3477.25
8	Animal Sciences Research (TANUVAS)	0.00	0.00	0.00	0.00	0.00	0.00
9	Dairy Development	449.25	790.25	740.25	449.25	459.25	2888.25
10	Fisheries	60.09	60.09	60.09	60.09	1710.09	1950.45
11	Fisheries Research (TNFU)	4980.73	2185.93	1493.73	428.73	240.73	9329.85
12	Public Welfare Department (WRO)	9463.33	8626.33	8613.33	1588.30	1736.00	30027.29
13	Civil Supplies &Co operation	199.30	135.50	103.50	142.50	109.00	689.80
	Total	**24853.03**	**23700.54**	**18683.67**	**11032.22**	**12453.77**	**90723.23**

The total budget requirement for the implementation of various interventions by different department is ₹. **90723.23** lakhs


KARNATAKA
KERALA
SRI LANKA